INDIAN MEDICINE



PROF. DR. JULIUS JOLLY

INDIAN MEDICINE



BY

Dr. JULIUS JOLLY

Translated from German
and supplemented with Notes
BY

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WITH A FOREWORD BY
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FOREWORD

The works on the general history of Medicine do not give sufficient space to the Indian medicine. The latter is, however, important under two heads : The conceptions of the physicians of ancient India, like those of the astronomers and specialists in different sciences, have played a great role in the general culture of India and have entered in many philosophical doctrines as the basic elements. The theory of the Pranas and the psycho-physiological ideas of the Ayurveda have spread everywhere: the conceptions of logic in the Caraka Samhita are among the most ancient of the Nyayadarsana. Besides, the Indian Medicine has played in Asia the same role as the Greek Medicine in the west, for it has spread in Indo-China, Indonesia, Tibet, Central Asia and as far as Japan exactly as the Greek Medicine has done in Europe and the Arab countries. It is, therefore, one of the great domains of study for the history of thought in India as well as in the world. The importance of the Indian Medicine had already been realised by the Greeks of Alexander. Several of its texts have been translated into Arabic since the first cultural contacts of the Muslims with India. In the middle of the sixteenth century its most precious drugs have been studied by the Portuguese Garcia-da-orta. In the seventeenth century its interest had been recognised in Java by the Dutch Bontius. But it is chiefly at the end of the nineteenth century that it had been studied by H. H. Wilson from the Sanskrit documents and by Csoma-da-Koros from the Tibetan version of the large-sized treatise the Sanskrit text of which has unfortunately been lost. Now it is more than a century that the first translation of Susruta was published in Latin by Hessler. The knowledge of numerous authors and Ayurvedic works has been placed at the disposal of the medical public in France by the numerous articles of Lietard in the encyclopaedic Dictionary of Medical Sciences numbering a hundred volumes of the state of Medicine and its history, in the second half of the nineteenth century (1864-1889). Thus, the study of the Indian Medicine came out of the province of the specialists in order to take its place in the classical science which, even though secured, ought to be still greater.

Two works which describe in great details the ideas contained in the principal Sanskrit treatises, chiefly those that relate to the pathology and nomenclature of the diseases have been consecrated to it; they are : — (1) *commentary on the Hindu System of Medicine* by Th. A. Wise (Calcutta, 1845) and (2) *Medicine* (in German) by J. Jolly, in the Encyclopaedia of Indo-Aryan Research of Buhler and Kielhorn. The first has to its credit two editions (1860 and 1900). The second deserves to-day, at the fiftieth anniversary of its publication (1901), an English translation which would secure for it a greater utilisation.

Since that time some important and new sources in the Tibetan versions have been discovered and studied notably by P. Cordier. The Tamil sources, unjustly neglected for a very long time, have been utilised by Dr. Paramananda Mariadassou. A portion of the Mongol version of the same Tibetan translation of a Sanskrit treatise which had been formerly used by Csoma has been published with a Russian translation by Posdneev. The place of the doctrines of the Medical schools in Indian philosophy has been noted by Dr. S. N. Dasgupta. Thanks to the progress in historical studies, it is possible hereafter to consider with greater precision than heretofore, the problems of the correspondences of the Indian Medicine with those of Greece, Iran, Islam and China. Besides, the therapeutics has been studied and the pharmacological value of the old Ayurvedic drugs has been fixed. But it will be profitable to consider the results already obtained half a century ago when Jolly brought them together.

College de France, Paris Ve

J. FILLIOZAT

An Appreciation

We owe a great debt to the German Indologists for their incessant study of Indian literary and cultural history on strictly scientific lines for more than a century. In every branch of Indology we have to refer frequently to the solid work done by these great pioneers of Indological research. Among these pioneers the name of Dr. Jolly stands foremost in the field of the history of Indian Medicine on account of his monumental volume on "*Medizin*" in the Encyclopaedia of Indo-Aryan Research published fifty years ago. This volume is a model of critical research condensed with the utmost brevity of words without omitting any important detail of fact or text bearing on the history of Indian Medicine. It is a pity that such an important book, the study of which is so vital to the history of the Āyurveda, should remain without any translation in English or any modern Indian language in this Bhāratavarsa—the home of the Āyurveda.

During the course of my study of the history and chronology of Indian medical literature and allied subjects like the history of Indian plants of medical and nutritive value, I have had occasion to consult Dr. Jolly's *Medizin* but was much handicapped in my efforts to study it closely in the absence of an English translation. I, therefore, received with alacrity the idea of preparing an English translation of Dr. Jolly's book entertained by my esteemed friend Shri C.G. Kashikar some years ago. It is highly creditable to Shri Kashikar that he should succeed in translating Dr. Jolly's book into English after years of labour in spite of his arduous work on the edition of the Rgveda and other Vedic texts, which have taken much of his time and energy. I feel confident that Shri Kashikar's English translation of Dr. Jolly's book prepared with scholarly care and zeal will be thankfully received by all teachers and students of the Āyurveda not only in India but also in other countries where Indian literature and culture are studied with respect. The bibliographical Notes added to this translation prepared by Shri Kashikar enhance the value of the translation as they take note of all important books and articles on Indian Medicine published during the last fifty years. The reference

value of the present translation with the appendices added by Shri Kashikar is very great not only to all lovers of the Āyurveda but to every research worker in the field of Indian Culture and Medicine. I congratulate Shri Kashikar heartily upon the successful execution of a difficult task with the utmost regard for literary veracity and scholarly precision.

B. O. R. Institute, Poona 4.
26-12-1951

P. K. GODE

PREFACE

BY THE TRANSLATOR

The author of the original work did not write any preface to his book. This translation is the outcome of a study of Āyurvedic literature as an offshoot of the study of the Vedic literature. Having shown some interest in the study of Medicine in the Vedic literature, I was asked to deliver lectures on the history of Āyurvedic literature at the Āyurveda Mahāvidyālaya, Poona, during the years 1941–43. While studying this subject I found frequent references to Jolly's *Medizin* in works dealing with that subject. Having already obtained some knowledge of the German language, I read and translated for my own use the first chapter of that book and consequently translated the entire book. It was suggested to me later on that the translation, if published, would be useful not only to the students of the Indian medical science but also to the students of ancient Indian culture in general. In pursuance of this suggestion, permission to publish the English translation was secured. Having failed in my efforts to find out a publisher for the same, I myself undertook its publication with the co-operation of the authorities of the Āyurveda Mahāvidyālaya, Poona.

Dr. Jolly's *Medizin* forms part of the series of the *Encyclopaedia of Indo-Aryan Research* (Vol. 3, part 10) founded by Dr. Bühler and continued by Dr. Kielhorn. The entire series was a solid contribution to the study and research of the various branches of ancient Indian learning and *Medizin* was no exception to the same. The book is a model of scientific study. Even though small in size, it is full of information so laboriously and skilfully compiled together, taking into account the entire literature on Medicine from the Vedas down to the Bhāvaprakāśa. It is a great compliment to the western scholarship that a Sanskrit scholar without any special knowledge of the medical science should produce such an authoritative and solid work on a practical science like the Āyurveda. No work of this nature has, so far as I know, been published in any Indian language. I firmly believe that this work will really prove very helpful for conducting research work in Āyurveda. There is much in western scholarship which we have still to learn. A historical approach as has been made in writing this book is a dire necessity for Āyurvedic research work—

both literary and practical. In the case of a science like Āyurveda which has been lying in a stagnant condition for centuries together, the necessity is more keenly felt. The critical studies made by Dr. A. F. R. Hoernle with regard to the comparative chronology of the different portions of important works like the Carakasaṃhitā, Suśrutasaṃhitā and Mādhavanidāna etc. have yet to be followed in India. I hope the present translation will create enthusiasm for such studies at least among a few scholars in India. The studies published in English are accessible to Indian scholars; but that is not the case with those published in other languages like German and French. Notwithstanding the fact that some important work is still being done at certain European and American Universities in the field of India's ancient culture in general, I feel it is time that important works in those languages are translated into English or some modern Indian language for the benefit of our scholars. In this connection a special mention may be made of a recent work in French by Dr. Filliozat : *La Doctrine Classique de la Médecine Indienne : Ses origines et ses paralleles Grecs.*[1]

I have tried to make the translation as literal as possible, so much so that the idiom of the German language has often been preserved intact. The very beginning sentence of the first chapter will bear testimony to this. For this I crave the indulgence of the reader. Not being conversant with the medical science, I might not have used proper technical terms. While translating the work I have verified the references to Ayurvedic works and thus have been able to remove a few printing mistakes in the original book which otherwise would have remained incorrected. In the case of references to important works like the Caraka Saṃhitā, Suśruta Saṃhitā and Aṣṭāṅgahṛdaya, I have consulted the latest critical editions of the works and have

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1 A very brilliant Note in English entitled *Recent Research in Ancient Indian Medicine* has been written by Mario Bussagli in the *East and West* (Quarterly Review published by the Instituto per il Medio ed Estremo Oriente) Year 11, No. 3, October 1951, pp.147-50. It gives a short summary of the new facts brought out in the above-mentioned book of Dr. Filliozat as well as in the book of E. Benveniste : *La doctrine Medicale des Indo-Europeens. Revue de l' Histoire des Religions, tome CXXX.* It may also be noted that very recently Dr. R. G. Harshe of Poona delivered a series of lectures on the researches made by Dr. Filliozat at the Ayurveda Mahavidyalaya, Poona. A summary of these lectures is shortly to be published in the Marathi journal of the Mahavidyalaya.

modified the references accordingly. Extensive literature has been published since the publication of Prof. Jolly's work in 1901. I have, therefore, thought it fit to add bibliographical Notes with a view to bringing the book up-to-date. In giving these Notes I have tried to make a reference to as many editions of a work as came to my notice without, however, claiming to be comprehensive. The bibliographical Notes as given here do not cover the entire literature published in the field of Indian Medicine. Only such books and articles have been referred to in the Notes as were directly concerned with the subject matter of the main book. There is much that remains outside the scope of these Notes. For example,the papers dealing with the history of Indian plants written by Prof. P. K. Gode and others could not be mentioned because the main book gives only the general lines of treatment and does not go into the details. Certain clarifications and corrections were found to be essential and these have also found place in the Notes. In this connection I have derived some help from my Vaidya friends in Poona. At the end I have given a Sanskrit Index and a General Index which, though existing in the original work, had to be compiled anew. The supplementary Notes given by me have also been taken into account while compiling the indices. A thorough list of abbreviations has been given at the beginning mentioning the latest editions wherever possible. As a result of my study of recent works as recorded in the supplementary Notes, a large number had to be added to the original list. Types with diacritical marks to denote Sanskrit words have been used throughout except in a few cases where, it is hoped, the reading will not be found so difficult. The system of transliterating Sanskrit words has been given at the beginning for the convenience of the Āyurvedic readers in India who are generally not accustomed to it. This system is in vogue for a very long time in the field of Sanskrit and Oriental studies throughout the world and it is hoped Āyurvedists will make it a point to adopt it whenever they have an occasion to write Sanskrit words in Roman characters.

In spite of scrupulous care, a few errors have occurred in printing. These have been recorded in the errata and the reader is requested to rectify them accordingly before reading the book.

ACKNOWLEDGMENTS :— I have now to do the pleasant duty of acknowledging the manifold help received by me with regard

to the publication of this work. First of all, I must thank the proprietors of Messrs. Walter de Gruyter, Berlin, for allowing me to publish my translation of Jolly's *Medizin*. I am grateful to Dr. J. Filliozat—a great scholar of philology as well as medical science, for obliging me with an enlightened Foreword to this book. His contributions to the knowledge of the history of the Indian medical science are of far-reaching effect and his conclusions, based of course on sound evidence, that the Indian science not only played a leading part in fixing the scientific thought of Asia, but also has left a mark on the scientific thought of ancient Greece and therefore of the West, will be widely appreciated. I deem it an honour to have a Foreword to my book by such a great scholar. In compiling the Notes I have made use of the writings of a number of scholars published during the last half century and I most gratefully acknowledge the debt due to them. To the authorities of the Āyurveda Mahāvidyālaya, Poona, I am indebted in many ways. As already said, the opportunity given to me by them to teach the history of Āyurvedic literature was entirely responsible for my study of this subject. In this connection, I bow to the memory of the late Āyurvedācārya Purushottamshastri Nanal—the moving spirit of the Mahāvidyālaya, who had commendable organising capacity and great enthusiasm for the uplift of Āyurveda. Moreover, the Mahāvidyālaya facilitated the publication of this book by printing a number of pages of this translation in their journal " Āyurvidyā. " I have especially to express my thanks to my friend Vaidya B.V. Gokhale, Āyurvidyā Pāraṁgata, Principal of the Āyurveda Mahāvidyālaya, Poona, for his keen interest in the work and for reading the entire press-copy and making very useful suggestions and also for reading the proofs. I must also thank Shri D. S. Marathe, B. A., LL. B., Poona, for revising my translation of the German text. To Dr. V. V. Gokhale, B. A., Dr. Phil. (Bonn) I am thankful for his keen interest in the publication of this work and also for his valuable help in regard to the revision of the translation. I also acknowledge with thanks the help rendered by Vaidya K. V. Kulkarni, Āyurvidyā Pāramgata, Vaidya N. V. Bhave, Āyurvidyā Pāramgata, Vaidya S. G. Vartak, Āyurvidyā Viśārada and Dr. M. P. Joshi, L. C. P. S.—all of the Āyurveda Mahāvidyālaya,Poona. I cannot forget the interest taken in this book and the guidance given from time to time by my esteemed friend Prof. P. K. Gode, M. A., Curator of the Bhandarkar Oriental Research Institute, Poona. He has also rendered

material help in reading the proofs and has also obliged me by writing an Appreciation of the work. I gladly acknowledge the encouragement and help given by my honoured friend Dr. R. N. Dandekar, Hon. Secretary of the Bhandarkar O. R. Institute. I express my heart-felt thanks to him. To Dr. R. G. Harshe, B. A. (Tilak), D. Litt. (Paris) of the Deccan College Institute, Poona, I express my thanks for his help in rendering some French passages into English. Dr. C. G. Pandit, Indian Council of Medical Research, New Delhi, was kind enough to read a few printed pages of the translation and to express his appreciation of the same. I offer him my best thanks. I must also acknowledge the help given by my friend Shri J. S. Tilak, B. Sc., Editor of "Kesari", Poona. Last, but not least, I must thank Mr. M. D. Gurjar, B. Sc., proprietor of the Ayurvidya Mudranalaya, Poona, for printing the book in a satisfactory manner.

Lastly, I shall consider my labours amply compensated if this translation proves useful to the advance of research in Āyurveda even to the smallest extent.

Vaidika Saṃśodhana Maṇḍala,
Poona 2 (India). 28th October, 1951
Dhanvantari Day, Saṃvat 2007.

C. G. KASHIKAR

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Abbreviations

ABORI	*Annals of the Bhandarkar Oriental Research Institute*, Poona
AHr	*Aṣṭāṅgahṛdayasaṁhitā* with the commentaries of Aruṇadatta and Hemādri edited by Vaidya Harishastri Paradkar, Nirṇaya Sagar Press, Bombay, 1939
AIOC	*All-India Oriental Conference*
AS	*Aṣṭāṅgasaṁgraha* with the commentary of Indu edited by T. Rudraparasava, 3 Vols., Trichur, 1913-24. For the purpose of reference the text-edition by Ganeshshastri Tarte (Bombay, 1888) is used. Reference to page is given.
ASS	*Ānandāśrama Sanskrit Series*, Poona
AV	*Atharvaveda Saṁhitā*
Bhāv	*Bhāvaprakāśa*
Bhr	Report on the search for Sanskrit manuscripts in the Bombay Presidency during the year 1882-3 by Dr. *R.G. Bhandarkar*, Bombay, 1884
Bibl. Ind.	*Bibliotheca Indica*, Calcutta
Bikaner	A Catalogue of Sanskrit manuscripts in the library of H. H. the Maharaja of *Bikaner* compiled by Dr. R. L. Mitra, Calcutta, 1880
BL	Lists of Sanskrit manuscripts in *Private libraries* in the Bombay Presidency by *R. G. Bhandarkar*, part 1, Bombay, 1893
Bower MS	*Bower Manuscript* edited by Dr. A. F. R. Hoernle, Calcutta, 1909
BP	Report on the search for Sanskrit manuscripts in the *Bombay Presidency* during the year 1883-4 by Dr. R. G. Bhandarkar, Bombay, 1887
B–R	*Bohtlingk and Roth*, Sanskrit Worterbuch, 7 Vols., St. Petersburg, 1852-75
Burnell	A Classified Index to the Sanskrit manuscripts in the Palace at Tanjore, by A. C. Burnell, London, 1880
BV	*Bhāratīya Vidyā*, Bombay
BW	*Bohtlingk*, Sanskrit Worterbuch in abridged form
Cakra	*Cakrapāṇidatta*
Car	*Caraka Saṁhitā* with Cakrapanidatta's commentary Āyurvedadīpikā, edited by Vaidya Yadavji Trikamji Acharya, Nirṇaya Sagar press, Bombay, 3rd edition, 1941

CC	*Catalogus Catalogorum* by Theodor Aufrecht, 3 parts, Leipzig, 1891, 1896, 1903
comm.	*Commentary*
edn	*Edition*
EI	*Epigraphia Indica*
ERE	*Encyclopaedia of Religion and Ethics*
FI	*Florentine* Sanskrit Manuscripts examined by Theodor Aufrecht, Leipzig, 1892
Garbe, Verz.	*Verzeichnis der indischen Handschriften der k. Univ. Bibliothek* by Richard Garbe, Tübingen, 1899
Grundr.	*Grundriss der Indo-Arischen Philologie und Altertumskunde* (Encyclopaedia of Indo-Aryan Research) edited by Bühler and Kielhorn
HHC	*History of Hindu Chemistry* Vols. I–II by Dr. P. C. Ray, Calcutta
HIL	*History of Indian Literature* Vol. III (German) by Dr. M. Winternitz
HIM	*History of Indian Medicine* Vols. I–III by Dr. G. N. Mukhopadhyay, Calcutta University
HIP	*History of Indian Philosophy* Vols. I–III by Dr. S. N. Dasgupta, Calcutta
Hist. Dharm.	*History of Dharmaśāstra* Vols. I–III by Dr. P. V. Kane, BORI, Poona
HSL	*History of Sanskrit Literature* by Dr. A. B. Keith
IA	*Indian Antiquary*
IAlt.	*Indische Altertumskunde*, parts 1–4 by Christian Lassen, 1843–72
IC	*Indian Culture*, Calcutta
IHQ	*Indian Historical Quarterly*, Calcutta
ILit.	*Indische Litteraturgeschichte* (History of Indian Literature) by Dr. A. Weber, 1st edn 1852, 2nd edn 1876, English trans. 1882
IO	*Library of the India Office*, London
IS	*Indische Studien* edited by Dr. A. Weber
IStr	*Indische Streifen*
JA	*Journal Asiatique*, Paris
JAOS	*Journal of the American Oriental Society*
JASB	*Journal of the Asiatic Society of Bengal*, Calcutta

JBU	*Journal of the University of Bombay*
JGRS	*Journal of the Gujarat Research Society*, Bombay
Jiva. Vidya.	*Jivananda Vidyasagar*, Calcutta
JRAS	*Journal of the Royal Asiatic Society of Great Britain and Ireland*, London
JUPHS	*Journal of the U. P. Historical Society*, Allahabad
KZ	*Kuhn's Zeitschrift fur vergleichende Sprachvorschung*
L	*Notices of Sanskrit Manuscripts* by Dr. Rajendralal Mitra, Calcutta, 1871–92
Manu	*Manusmṛti*
MN	*Mādhavanidāna*, Nirṇaya Sagar press, Bombay
MS	*Manuscript*
OB	*Scherman's orientalische Bibliographie*
Oxf	*Catalogus Codicum Sanscriticorum Bibliothecae Bodleianae, Confecit Theodor Aufrecht*, Oxonii, 1864
Peters	Detailed Report of operations in search of Sanskrit Manuscripts in the Bombay circle. I. August 1882–March 1883. II. April 1883–March 1884. III. April 1884–March 1886. IV. April 1886–March 1892. Bombay, 1883–94
PO	*Poona Orientalist*, Poona
Proc. ASB	*Proceedings of the Asiatic Society of Bengal*, Calcutta
PS	*Pratyakṣa Śārīra*, Vols. I & II by MM. Dr. Gananath Sen, Calcutta
RV	*Ṛgveda Saṁhitā*
RYS	*Rasayogasāgara* by Vaidya Hariprapannaji, Bombay
Śārṅg	*Śārṅgadhara Saṁhitā*, Nirṇaya Sagar press, Bombay, 1922
SBE	*Sacred Books of the East* edited by Prof. Max Müller, Oxford
SIH	*Surgical Instruments of the Hindus* by Dr. G. N. Mukhopadhyay, Calcutta
Stein	Catalogue of the Sanskrit Manuscripts in the Raghunātha temple library of H. H. the Maharaja of Jammu and Kashmir, prepared by Dr. M. A. Stein, Bombay, 1894
Su	*Suśruta Saṁhitā* with the commentary of Ḍallaṇa, edited by Vaidya Yadavji Trikamji Acharya, 1st edn. 1915, 2nd edn. 1930-1, 3rd edn 1938, Nirṇaya Sagar press, Bombay
trans.	*Translation*
Vaṅg	Vaṅgasena's *Cikitsāsārasaṁgraha*, Venkateshvar press, Bombay, 1905

Viṣṇu	*Viṣṇusmṛti* edited by Dr. Jolly, Calcutta, 1881
Vṛ	Vṛnda's *Siddhayoga* ĀSS 27, Poona, 1894
W	*Verzeichnis der Sanskrit Handschriften der königlichen Bibliothek in Berlin* by Dr. A. Weber, Berlin, 1853
Yājñ	*Yājñavalkyasmṛti*
ZDMG	*Zeitschrift der deutschen morgenländischen Gesellschaft*, Berlin.

System of Transliteration

a	ā	i	ī	u	ū	ṛ	e	ai	o
अ	आ	इ	ई	उ	ऊ	ऋ	ए	ऐ	ओ
au	ṁ	ḥ	k	kh	g	gh	ṅ	c	ch
औ	अं	अः	क्	ख्	ग्	घ्	ङ्	च्	छ्
j	jh	ñ	ṭ	ṭh	ḍ	ḍh	ṇ	t	th
ज्	झ्	ञ्	ट्	ठ्	ड्	ढ्	ण्	त्	थ्
d	dh	n	p	ph	b	bh	m	y	r
द्	ध्	न्	प्	फ्	ब्	भ्	म्	य्	र्
l	v	ś	ṣ	s	h				
ल्	व्	श्	ष्	स्	ह्				

INDIAN MEDICINE

I. Sources

§ 1. **Modern Works** :— Although, thanks to the discovery of the Central Asiatic manuscripts and Hoernle's splendid work on them, (§ 13) medicine can now be regarded as the oldest of Indian sciences and has been proved to be the science in which the Indians specialized first, yet in view of its continued existence upto the present time and in view of its continual development, it would be more to the purpose from the point of view of method, to begin a review of Sanskrit medical literature with a short reference to the modern works and then go back successively to the older works and finally to the earliest ones.

In spite of the advance made by European medicine through English Colleges and Hospitals, the Indian people still like to consult the modern Vaidyas and Kavirājas–although they grumble about their high fees and the costliness of their medicines. Like the modern Indian physicians who still continue to prescribe[1] their time-honoured recipes like the *Cyavanaprāśa* and red sandal powder, their assiduous literary production goes on along the same old paths. Text–books like Binod Lal Sen's Āyurveda-vijñāna[2] in two parts could have been written in the same style 1000 years ago. The medical Sanskrit dictionary *Vaidyakaśabdasindhu* by Umeshchandra Gupta, which is of value also for the Sanskritists, contains a collection of medical technical terms with explanations and numerous citations from the medical glossaries[3]. Special collections for Materia Medica exist in greater number; e. g. *Āyurvedīyadravyābhidhāna*[4] of K. B. Lal Sengupta printed in Calcutta and the work of K. K. Prasanna Vitasarkar and Bholanath Śarmā used in Hoernle's Bower MS., the *Nighaṇṭuratnākara* of Godbole[5] printed in Bombay and the *Bṛhannighaṇṭuratnākara* of Dattaram Chaube[6], in both of which works also *Anannasa*, *Tamākhu*, *Ḍaktarīmatānusāramūtraparīkṣā* and other modern elements have found admission. Of monographic works mention may be made of the *Cobacīniprakāśa* on *Cobacīnī* (*Sarsaparilla*) as a remedy against syphilis and other

diseases compiled under the auspices of the famous Ranjit Singh. To most of these publications are added translations in Bengali, Hindi, Gujarati, Marathi, Singhalese and other modern Indian languages; others are written only in modern Indian languages. The old Sanskrit texts like *Caraka*, *Suśruta*, *Aṣṭāṅgahṛdaya*, *Mādhavanidāna*, *Śārṅgadhara Saṁhitā* and others are often printed with or without the old commentaries and with or without the translations in modern Indian languages. The critical editions of Ānandāśrama Sanskrit Series of Poona deserve special mention. The more rare English publications, e. g. Umeshchandra Dutt's beautiful *Materia Medica of the Hindus*,[8] Sir Bhagavat Sinhjee's *A short History of Aryan Medical Science*[9]– the work of an Indian Prince, Avinash Chandra Kaviratna's translation of the Caraka Samhitā (see § 9) serve the object of rousing the interest of English readers for the Indian Medicine.

(1) Cf. the supplement to Avinash Chandra Kaviratna's Trans. Part 14. (2) Calcutta 1887, pp. 729, 686. (3) Calcutta 1894, pp. 22, 12, 1112. (4) Calcutta 1875, pp. 244. (5) Bombay 1867, 3 parts. pp. 865, 1277, 1201. cf. Sinhjee, ibid. 122 ff. (6) 3rd part 1891, upto pp. 1346, 248. (7) Lahore, 1851. pp. ii, 81. (8) Calcutta 1177, pp. xvi, 354. (9) London 1896, pp. 280.

§ 2. **16th to 18th Century** :–As soon as one goes back behind the 19th century, great difficulties arise as to the dates of the literary works. So only such of the numerous Sanskrit texts, besides the well known chief works, will be mentioned as are partly already printed and partly only known from the manuscripts catalogues as dealing either with the collective medicine or with particular parts thereof (for glossaries and veterinary science see § 11 ff.). Mention will also be made of those works the dates of which are determinable a little more easily, as also of those the date of compilation of which is either given in the MSS or can approximately be fixed on internal evidence. According to Sinhjee ibid. many works are indeed exactly datable. Thus he places in the 18th century : *Ātaṅkatimirabhāskara* of Balarama in Banaras– a great work also mentioning tea[1]. *Āyurvedaprakāśa* of Madhava 1713; IO No. 950 denotes a MS written in 1786; *Yogataraṅgiṇī* of Trimalla 1751; this well known collection of recipes[2] must, however, be much older, as L 203– the MS written in 1498 of another work by Trimalla[3] is recorded. According to the unreliable dating of Umeshchandra Gupta (ibid. Preface), the following works belong to the 18th Century:– *Bhaiṣajyaratnāvali* of Govindadāsa (Calcutta 1893, pp.788)

a collection of recipes, also much cited in Dutt's Materia Medica; *Rājavallabhīyadravyaguṇa* of Nārāyaṇa 1760, also mentioned by Dutt (Calcutta 1868, pp. 106); *Prayogāmṛta* of Vaidyacintāmaṇi, the most extensive work on therapy; for its contents see Aufrecht Oxf. 316; *Vaidyāmṛta* of Nārāyaṇa and others. Vaidyarāja's *Sukhabodha*, an easily comprehensible text-book of therapy is certainly written in 1624 which date, according to the era, may mean[4] either 1702 or 1567.

17TH CENTURY:—Definite dates are[5]: *Vaidyavilāsa* of Raghunātha Paṇḍita 1697, a short hand-book, printed; *Vaidyarahasya* of Vidyāpati 1682, mentions syphilis (according to Sinhjee, written in 1698 which date, however, is a result of mistaking the date of compilation for the date given in the MS L); *Cikitsāratnāvali* of Kavicandra 1661, on pathology and therapy, copied from Mādhavanidāna according to Haas and Eggeling; *Vṛttaratnāvali* of Maṇirām Miśra 1641, a short text-book; *Yogasaṁgraha* of Jagannātha 1616, on therapy etc. The *Yogaratnākara* by an unknown author, printed in ĀSS in 1889 (pp. 486) covers the whole medicine with the exception of surgery and anatomy, cites Nirṇayasindhu (1611), Bhāvaprakāśa (16th cen.) and other modern works; it cannot, however, be composed later than 1746, the date of the earliest MS used for the edition (Sinhjee: Yogaratnākara 1676). Lolimbarāja's *Vaidyajīvana*, a popular work much commented upon and translated in different modern Indian languages, a very short presentation of therapy in different metres, and full of poetic passages, is according to Sinhjee, composed in 1633; however, B.4,241 denotes a MS already written in 1608.

16TH CENTURY :— The most prominent production of this century is the universally esteemed Bhāvaprakāśa of Bhāvamiśra who was evidently a famous physician of Banaras[6]. The edition of Jīvānanda Vidyāsāgara[7] is used here which, after a cursory collation with the good old Tübingen MS of 1558–9[1], can be considered as authentic in general in spite of many printing mistakes. Bhāvaprakāśa cannot be much older than this MS, since it mentions syphilis (*Phiraṅga*) introduced by the Portugese and its remedy Cobacīnī which must have been imported about 1535. Pūrvakhaṇḍa of this extensive work treats in two Bhāgas and six Prakaraṇas the origin of medicine, cosmology, anatomy, embryology, Kaumārabhṛtya, dietetics, pharmacology (with

many popular and foreign names) etc.; the still more extensive Madhyakhaṇḍa treats in four Bhāgas special pathology and therapy; the Uttarakhaṇḍa of only eleven pages deals with aphrodisiacs (*Vājīkaraṇa*) and elixirs. Particularly valuable are the numerous citations[9] that deviate much from the printed texts of Caraka, Suśruta etc. The small pharmacological work *Guṇaratnamālā* of Bhāvamiśra[10] is still not printed. Comparable with Bhāvaprakāśa in its extensive character, size and contents is the medical text-book *Āyurvedasaukhya*[11] which forms a part of *Ṭoḍarānanda*, inspired by Ṭoḍar Mall (1589) the famous Hindu minister of emperor Akbar. The oldest MSS of the other parts of this great encyclopaedia denoted in the Catalogues belong to the last three decades of the 16th century. The *Yogacintāmaṇivaidyakasārasaṁgraha*[12]– a collection of recipes composed by the Jain Harṣakīrtisūri must have originated between 1668 or 1666[13], the dates of the two oldest MSS and circa 1535, since Phiraṅga and Copacīnī (Cobacīnī) are mentioned in it, as they are mentioned in Bhāvaprakāśa. Opium *(aphīma, ahiphena)* and quicksilver *(pārada)* are also often mentioned in it.

(1) Not in Aufrecht's CC. (2) Cf. Dietz, *Anal. Med.* pp. 145 ff.; IO 955 ff. (3) Also the MS No. 667 (of Bikaner) of Yogataranginī is written at least in 1663. (4) IO 942 ff. (5) IO 949, 958, 953, 945; L 1480; ZDMG 30, 652; W 296. (6) *Ayurvedavijnana*, 1. 12. (7) Calcutta 1875, pp. 36, 37, 292. 178, 162, 229, 132, 228. (8) Garbe, Verz. No 153. (9) Cf. Wise, Comm. pp. 10 ff.; Oxf. 309-11; Dutt, *Mat. Med.* XI; Sinhjee ibid. pp. 36-8; Umeshchandra Gupta ibid. (10) IO 981. (11) W 280 ff. (12) Bombay 1869, pp. 268 with translation in Marwari language. (13) Cf. Garbe, Verz. No 165; B 4. 232; Peters 3, 399.

§ 3. **The Later Middle Age** :— In this period probably falls the composition of numerous works, partly printed, on Rasa, Rasendra, metallic and particularly mercury preparations for internal and external use. The quicksilver cures all diseases, says Narahari[1], and it is also recommended especially for fever, diarrhoea, jaundice *(kāmalā)*, diseases of the lungs etc., and later also for syphilis[2]. The calcination of quicksilver and the pharmaceutical preparations thus obtained probably originated with the Arabs (see § 26). *Rasapradīpa*, *Rasāmṛta*, *Rasendracintāmaṇi* are already cited in Bhāvaprakāśa. *Rasacintāmaṇi*, *Rasadarpaṇa*, *Rasaratnapradīpa*, *Rasaratnāvali*, *Rasarahasya*, *Rasarājahaṁsa*, *Rasasindhu*, *Rasārṇava*, *Rasālaṁkāra*, *Rasāvatāra* are quoted in Āyurvedasaukhya. All these works must, therefore, have

existed already in the 16th century. The oldest and definitely datable work of this kind appears till now to be the commentary by Merutunga, a Jain, written in 1386 on Kaṅkālaya Rasādhyāya[3] which must naturally be older than the commentary. In *Sarvadarśanasaṁgraha*[4] also written in the 14th century, the above-mentioned Rasārṇava as well as Rasarahasya and *Rasesvarasiddhānta* are mentioned, whereby these three works are to be placed about 1300 at the latest. Rasārṇava is also cited in the *Rasaratnākara* of Nityanātha which deals in five Khaṇḍas first with the manufacture of metallic preparations and then (213 ff.) with the treatment of diseases. It is besides cited in Rasendracintāmaṇi of Rāmacandra which is arranged similar to Rasaratnākara (these two works are printed in Calcutta 1878, pp. 24, 782). The Rasaratnākara must have already existed in the 15th century, as B, 4. 236 denotes a MS written in 1473 and the Persian work on Indian medicine referred to by Haas (ZDMG 30, 630 ff.) denotes Rasaratnākara as a work generally used at that time, i. e. at the beginning of the 16 century. Still older than all these above-mentioned works is the comprehensive *Rasaratnasamuccaya*[5] available in a more correct edition, if it were really a work of Vāgbhaṭa, as stated by the editor who has indeed had many MSS. Still in some MSS the author is called Nityanātha or Aśvinīkumāra, or there is no author mentioned and at any rate this work which, in 30 Adhyāyas, deals exhaustively with various metallurgical and pharmaceutic processes, differs as strongly as possible from Aṣṭāṅgasaṁgraha (AS) and Aṣṭāṅgahṛdaya (AHr)[6] in contents as well as in style (see §6). The MSS of Rasaratnasamuccaya are also not old, the oldest (IO. 966) being of 1699 A. D.[7]

According to U. C. Dutt (Mat. Med. XII) Śārṅgadhara is the oldest author dealing with the processes of calcination and similar processes. He places the Śārṅgadhara Saṁhitā in the Mohamedan epoch, because Ahiphena and Ākarākarabha[8] are mentioned in it. According to its editor Jivanram, Śārṅgadhara Saṁhitā is often cited[9] in Bhāvaprakāśa (16th cen.) and has in its turn used Vṛnda (circa 10th cen. A. D. See § 5). According to Grierson[10] Śārṅgadhara Saṁhitā is to be placed about 1500 on internal grounds. Since there is a commentary[11] on Śārṅgadhara Saṁhitā by Vopadeva who flourished about 1300, Śārṅgadhara Saṁhitā must have been written at the latest in the 13th century. His short but solid text-book is not limited to metallic preparations, but deals with much more in three Khaṇḍas and 32

Adhyāyas : (i) Weights and measures, quality of medicinal stuffs, effect of seasons, diagnosis and prognosis, effect of medicine, anatomy and physiology, embryology, sections and subsections of diseases (*rogagaṇanā*). (ii) Decoctions, broths, infusions, cold preparations (*hima*), pastes, powders, pills, electuaries (*pāka*), medicated ghees (*ghṛta*), liquors, oxides (*bhasma*) of gold and other metals and preparations of quicksilver. (iii) The usual methods of cure like Bṛmhaṇa, Svedana etc. (See § 24). In diagnosis he exhaustively describes Nāḍīparīkṣā, in diseases he distinguishes a greater number of subsections than that in Caraka, Suśruta, Mādhavanidāna, Vṛnda and Cakradatta. Judged by the numerous editions[12] unfortunately deviating rather strongly like MSS from each other, Śārṅgadhara Saṁhitā is still much read.

On the above-mentioned Nāḍīparīkṣā,there is a whole group of special works (see § 20) the oldest of which go back to this period while others of latest date are available partly with translations in modern Indian languages.

Vopadeva, the above-mentioned commentator of Śārṅgadhara Saṁhitā, has also written many independent works on medicine, of which Śataśloki on the preparation and use of powders, pills and similar things is several times printed with commentary by the author himself and is most famous (e. g. Madras 1860, Bombay 1889). Vopadeva, also known as a grammarian, was the son of Keśava, an equally literarily active physician in Berar and a protege of the famous minister Hemādri in Devagiri[13] (between 1260 and 1309) who himself has also written commentaries on medical works (see § 6).

As a specimen of monographs on individual diseases of this period, which came in vogue very early, mention may first be made of *Jvaratimirabhāskara*[14] composed by Kāyastha Cāmuṇḍa in 1489, on fevers and their treatment. The fever, particularly Saṁnipātajvara, was mostly treated in monographs. Other special works are related to Bālacikitsā, Śiśurakṣā, eye-diseases, poisoning, leprosy, diabetes, jaundice etc. Momahaṇa wrote in 1411 Momahaṇavilāsa under the reign of Mahmud Shah in Kalpi. According to L. 779 it is a great work on aphrodisiacs, Strīroga and Bālaroga. The Śiśurakṣāratna on Kaumārabhṛtya by Pṛthvīmalla[15] must have been written about 1400, since Madanavinoda is written by his father in 1374 (cf. § 11).

The religious conception of pathology going back to the oldest times according to which diseases are a result of sins committed in previous births, is represented in a decisive manner by *Jñānabhāskara*[14] a comprehensive work (cf. §§ 15. 38). After an introduction important for proving the Greek origin of later astronomy, it describes in detail the diseases from the stand-point of Karmavipāka and prescribes penances, sacrifices and gifts that are necessary for it. An old MS of this work is written in 1500. The works on Karmavipāka e. g. the *Sāragrahakarmavipāka*[17] composed in 1384, belong more to the domain of Dharmaśāstra and are connected with the corresponding teachings of Smṛtis. The author of *Vīrasiṁhāvaloka*[18] (Bombay 1888) says that he deals with three sciences viz. law, astronomy and medicine, but the emphasis is laid on medicine. The author of this work is Vīrasiṁha a prince of the well known Rajput clan and the founder of a dynasty in Gwalior in 1375; he wrote the work in 1383.

One of the authors cited by Vīrasiṁha is Tīsaṭācārya, the composer of *Cikitsākalikā*[19], a complete text-book of medicine in which, among other things, Nāḍīparīkṣā is included. Since Tīsaṭācārya mentions Bhoja as one of his predecessors, he belongs to our period, if the well known king Bhoja of Dhara (11th century) is meant. His work is commented upon by his son Candraṭa whose some other medical works are still available.

(1) Rajanighantu 13, 111 in Garbe, *Die indische Mineralien* 15. 61. (2) Dutt, *Mat. Med.* 27-38. (3) W 297; BL 241; CC 2.15. (4) Oxf 247; Cowell & Gough 137-45. (5) ASS, Poona, 1890, (with pictures of crucibles for the metals). (6) Aufrecht CC also speaks against the authorship of Vagbhata; Cordier (*Vagbhata*, pp. 8 ff. with a table) expresses doubt. (7) For further works of this kind see Aufrecht CC. (8) *Mat. Med.* 113, 185. (9) Cf. also the citations in Oxf 311. Sinhjee places Sarng. after Bhav (!). (10) IA 23, 260. (11) W 285 ff. (12) Critical edition of Prabhuram Jivanram (Bombay 1891, pp. 155. 351, 12) is used. (13) Bhandarkar, *History of the Deccan*², 116; Bhr 36; 224 (14) Bikaner 643; Stein 183; CC 2,44; Garbe Vers. 73. (15) IO 964 ff. (16) W 287-89; IO 926 ff. (17) IO 573-75. (18) BP 86 ff.; BL 246; IO 946; Stein 189; CC 2, 142. (19) W 292. ff.; Oxf 357 ff.; L 3051; CC.

§ 4. **Vangasena and Cakradatta**:—Vangasena's *Cikitsāsārasaṁgraha* is a very comprehensive work (Calcutta 1884, pp. 1127) which, after a general introduction to pathology, duties of the physician etc. contains in its main body (13–944) an exhaustive description of

diseases and a still more comprehensive presentation of their treatment; then there is the elixir and Vajīkaraṇa (945–1006), then Bṛṁhaṇa, Svedana, Vamana etc.,lastly the dietetics and pharmacology, diagnosis and prognosis. In this work the picture appears essentially different from heretofore : In the field of pharmacy (1058–1113) nothing is said about calcination of metals, very little is spoken of the metals in general, Nāḍīparīkṣā is not mentioned in the medical examination and the opium does not appear. In the chapter on haemorrhoids Vangasena deals exhaustively, like later authors, with the three kinds of iron and six kinds of steel (among them Romaka), purification of the steel, the killing of iron by melting, powdering etc. (161 ff.). He also speaks of the properly purified quicksilver (574), of Rasaparpaṭa, the preparation of quicksilver (958) and other mercurial mixtures,but does not enter into the particulars of the methods of working upon mercury. The oldest MS of Vangasena is written in 1276[1] and another in 1320.[2] One may conclude perhaps from the name of Vangasena, whose father was called Gadādhara and was living originally in Kāñjikā, that he was a Bengali and was the contemporary of the Sena dynasty (Era of Lakṣmaṇasena 1119 ff.). The majority of MSS also shows the north-eastern origin. In citations Vangasena is very poor, but has quietly copied out[3] word for word from Mādhavanidāna in the description of diseases; many times his readings are better. His chapter on Ariṣṭa (1104 ff.) is similar to Susruta 1.28–33[4]. Many recipes, e. g. six ślokas in the chapter on Atisāra, are identical in the Bower MS[5]. Others can be traced to Vṛnda and Cakradatta.

Cakradatta, more fully Cakrapāṇidatta, in short also Cakrapāṇi or Cakra, was undoubtedly a Bengali. This prolific author, as he has described himself, was the younger son of one Nārāyaṇa who served king Nayapāla of Bengal as *Rasavatyadhikārin* and minister,and therefore may well be placed in 1060[6]. His most famous and often printed[7] work is a comprehensive therapy, the *Cikitsāsārasaṁgraha* which, however, is mostly copied from Vṛnda's Siddhayoga whom Cakradatta expressly mentions as his chief source[8]. Śivadāsasena has written a commentary on this work of Cakrapāṇidatta, which is already printed[9]. His commentary is based on another older commentary on the same work. Śivadāsasena has also commented on another work of Cakrapāṇi, namely *Dravyaguṇasaṁgraha*[10]; and at the end of this commentary he denotes himself as the son of Anantasena, the Ruler

of Bengal (*Gauḍabhūmipati*), consequently descended apparently from a branch of Vaidya dynasty of the Senas in Bengal. The Dravyaguṇasaṁgraha contains, as the title shows, chiefly a short survey of the effects of the medicinal stuffs, like the analogous sections in Caraka and Suśruta. His *Sarvasārasaṁgraha* and *Śabdacandrikā*[11]—a collection and explanation of pharmaceutical and botanical technical terms, are still not printed, and his both great commentaries on Caraka and Suśruta are partly printed (Cf. § 7 ff.). Cakradatta shows himself to be conversant with the calcination of certain metals[12], but he does not appear to have known opium and Nāḍīparīkṣā and mentions quicksilver only rarely[13].

(1) IO 952. (2) BP 86. (3) Cf. Eggeling, IO 951; Cordier, *Quelques donnees nouvelles 6* (Calcutta 1899). (4) Eggeling, l.c. 952. (5) Cf. Hoernle's remarks in his edition of Bower MS. (6) IO 938; ZDMG 53,378; Haraprasad Sastri, *School History of India* (Calcutta 1896) 33. (7) So says Rosts IO.Cat. (1897) 5; the OB (1887 ff.) upto 7 editions. Cited according to the edition of Jiva. Vidya (Calcutta 1888, pp. 471). (8) ZDMG 53, 377. (9) Calcutta 1887 (pp. 5.23,863 with Bengali translation) and others. (10) Calcutta 1871 (pp. 179). (11) Cf. Wilson. *Essays* B, p. 237; I. 562; IO 974. (12) cf. Dutt, *Mat Med*, XII. (13) l. c. XI.

§ 5. **Siddhayoga and Madhavanidana** :—Siddhayoga or Vṛndamādhava of Vṛnda with the commentary of Śrīkaṇṭhadatta is excellently printed in ĀSS (Poona 1894, pp. 665). Like Cakradatta (§ 4) it exhaustively deals in 82 Adhikāras firstly with the treatment of diseases from fever to poisoning wherein many recipes— mostly provided with corresponding titles are prescribed, and they can partly be identified with those in the Bower MS[1]. It then (pp. 515 ff.) deals with elixirs, aphrodisiacs, Bṛṁhaṇa, Svedana, Vamana, Virecana and the like, with the signs of approaching death (Ariṣṭa), Hygiene (Svasthādhikāra) and under the title Miśrakādhikāra it deals in short with physicians, patients, weights and measures and similar general questions. The close adherence of this work to a distinguished author like Cakradatta makes it probable that it had already attained great authority in his (Cakradatta's) times and consequently must have come into existence at least about a century earlier. Several long quotations from Vṛnda[2] are also found in Hemādri (13th cen.). Vṛnda is besides cited in Śārṅgadhara Saṁhitā (§ 3), in Vīrasiṁhāvaloka[3]

and also in some other works. Vṛnda prescribes quicksilver preparations less than Cakradatta[4]. In 7.13 quicksilver mixed with the juices of poisonous plants is prescribed for external use against lice. In the serial order of diseases Vṛnda follows, as he has said in 1.2 and as the comparison also confirms, the Gadaviniścaya or Rugviniścaya (see below) which must, therefore, be older. Also Vāgbhata must be older than Vṛnda who quotes[5] him in 1.27. His mention of a medicine imported from Persia, viz. Pārasīyayavānī (7.1) i.e. Yavānī grown in Persia, might be advanced as an argument against taking back his date too much. The commentary of Śrīkaṇṭhadatta contains many quotations from Caraka, Suśruta, AS, AHr, MN, Hārīta and other old authors. Since Śrīkaṇṭhadatta quotes an older commentator of Vṛnda, Candraṭa and Hemādri along with Bhoja, Cakradatta and Ḍallaṇa, he cannot have flourished before the 14th century.

The *Rugviniścaya* or *Mādhavanidāna* of Mādhava or Mādhavakara[6], son of Indukara, is the chief work on pathology (Nidāna) and is, therefore, simply called Nidāna[7]. The order in which this work treats the important diseases in 79 Nidānas along with their causes, symptoms and complications, has been the standard not only for Vṛnda and Vaṅgasena but also for all time to come, and is also preserved in such works like e. g. Bhāvaprakāśa which besides quote particularly Caraka and Suśruta. Mādhavanidāna is often literally identical with Caraka and Suśruta and in this case the borrowing has to be taken for granted; but his system, enumeration and description of diseases mark an advance on Caraka and Suśruta. Thus he devotes a special chapter for small pox (*Masūrikā*) whereas Suśruta mentions it only in minor diseases (Cf. § 66). The anteriority of Suśruta to Mādhavanidāna is proved by the Indian tradition (even though it is doubted by Haas), since e.g. Caraka and Suśruta are cited by Vāgbhaṭa, while Mādhavanidāna is not mentioned by him. As the predecessor of Vṛnda, Mādhava may be placed in the 9th century at the latest, or in the 8th if Mādhava may be identified with Badan, Yedan (i. e. Nidān ?)—a pathological work translated very early in Arabic. The numerous commentaries prove the fame of Mādhavanidāna, and of these, eight are mentioned in Aufrecht's Catalogus Catalogorum. The most famous is the often printed Madhukośa composed by Vijayarakṣita and Śrīkaṇṭhadatta in the 14th or 15th century[8].

(1) ZDMG 53, 378 ff. (2) l. c. 54, 274. (3) BP 87; Fl 348 ff. (4) e.g. Vṛnda 4, the chapter on chronic Grahaṇi which Cakra 44-53 has almost copied and to which he has added at the end two metallic preparations Rasaparpaṭika and Tamrayoga. Rasaparpaṭika is an orbicular preparation from melted sulpher and quicksilver, cf. Dutt, *Mat Med.* 32 f. Tamrayoga also contains quicksilver. (5) ZDMG l. c. (6) Jiva. Vidya.'s edition (Calcutta 1876 with Madhukosa pp. 443) is used. Out of the recent numerous editions mention may be made of U. C. Dutt's *Nidana* (2nd edition, Calcutta 1880) which is important on account of its English translation of many names of diseases added to it. To this and other editions a Bengali translation is added. Others contain Hindi, Marathi or Sinhalese translations. (7) Cf. Dietz, *Anal. Med.* p. 118; Wilson JRAS 6, 118; Haas, ZDMG 30, 662,652 ff; A. F. Muller, l. c. 34, 475; Dutt, *Mat. Med.* X; Cordier, *Quelques donnees* 5f. (8) The Joint authorship of Srikanthadatta is confirmed by a comparison of sources of Madhukosa (put together in IO 934) with authors used in Srikanthadatta's commentary on Vṛnda. An old MS of Madhukosa is written in 1529 A. D. (Oxf 357) cf. also the Addenda.

§ 6. **Vagbhata** :— Besides some apocryphal productions (cf. § 3) two big and kindred works are attributed to this author[1]; of these the bigger and evidently older is referred to in citations as Vṛddha Vāgbhaṭa and the other simply as Vāgbhaṭa. The latter work which is particularly respected and is frequently commented is properly called the *Aṣṭāṅgahṛdayasaṁhitā*[2] i. e. the quintessence of medicine and contains, with arrangement similar to Suśruta, in six sthānas and 120 adhyāyas a lucid and versified presentation of the whole medicine with special reference to surgery as in Suśruta. AHr conforms more closely with Caraka than with Suśruta. It also quotes both these authors. Thus in 6.40.84 and 88 both Caraka and Suśruta are quoted together; in 1.9.13 Caraka alone is quoted and in 6.30. 31 Suśruta alone is quoted. AHr besides quotes Bheḍa, Nimi, Kāśyapa, Dhānvantarīyāḥ and in the introduction (1.1) the son of Atri, Agniveśa and other Ṛṣis whose particulars are not given. At the end it also mentions the AS (Vṛddha Vāgbhaṭa) which the author clearly characterises as his chief source. On the evidence of Tibetan sources, Huth (whose results are indeed not undisputed) places the composition of AHr in the 8th century as the latest limit. A similar result would be obtained if the AHr can be identified with the book Astānkar (?) of the Arabic sources[3]. The citation in Vṛnda also appears to take back Vāgbhaṭa at least in the 9th century. The opium, pulse-feeling (Nāḍīparīkṣā) and the metallurgical process do not yet come

in here. Of the commentaries, Aruṇadatta's commentary named Sarvāṅgasundarī is very valuable and is much used by his successors. It is composed in the 15th century[1] at the latest. Hemādri's Āyurvedarasāyana is written at the end of the 13th century.

The AS of Vāgbhaṭa[2] which is frequently quoted in commentaries and is utilized in AHr for the explanation of some rigid statements, is recognised as a very old work at least so far as the major portion is concerned, not only by its priority to AHr but also by its form and contents. AS is composed of a mixture of prose and poetry which reminds us of Caraka and Suśruta (Cf. § 8 f.). In an entreaty a saying addressed to Buddha is preserved, while in AHr the Buddhistic tendencies, which are still present in it and which perhaps explain the special reception of this work in Tibet, have considerably faded. At the end of the AS, it is said about the author that he received the name Vāgbhaṭa after his grandfather–himself a distinguished physician, that he learnt under a teacher with the Buddhist name Avalokita and also under his own father Siṁhagupta and that he was born in the Indus region. The versified part often corresponds literally with AHr; but instead of 120 adhyāyas as in AHr, AS has 150, 50 i.e. one third of which constitute the sixth part (Uttarasthāna). In AHr the first five parts contain 80 adhyāyas and the last contains 40. The connection of AS with Caraka and especially with Suśruta from which a direct quotation is also found, is closer than that of AHr. However, AS contains much independent material and is, therefore, of the greatest value for verifying as well as for supplementing our Caraka and Suśruta. If AHr can really be placed in the 8th century or earlier, AS must naturally be still older. In the 7th century Buddhism was still in a flourishing condition in the Indus region. Yet, according to Huth, the Tibetan translations of AHr along with the commentary originated only in the first half of the 11th century.[3]

(1) Cf. W. 278-90; Oxf 303-9; Burnell 65; Roth Lit-Bl. f. o. Ph.1, 48-50 and ZDMG 49, 184 ff.; Huth, ZDMG 49,280ff. and Sitzb. 1895,267ff.; Cordier, *Vagbhata et l'Astangahrdayasamhita* (Besançon 1896, pp. 17); Jolly, *Zur Quellenkunde der indischen Medizin 1. Vagbhata*. ZDMG 54, 260-74. (2) According to the edition of A. M. Kunte containing the commentary of Arunadatta (2nd edition Bombay 1891, pp. 3. 29, 51, 599). In spite of the recent numerous editions, the first edition of Kunte (Bombay 1889, 2 Vols) retains its value on account of the word-index (Sabdanukramanika)

wanting in the second edition. Much useful is also the new text-edition of Sankarasastri containing some variant readings (Bombay 1900, pp. 792,12). (3) Cf. Cordier *Quelques donnees* 4; Jolly, l. c. 262. While going to press I have received a new work of Dr. Cordier on Vagbhata (JA 1901) in which he identifies Vaidya Vagbhata with the somewhat mythical court-physician of King Bhoja, following the statement of Merutunga and, therefore, places him in the 11th century. The other facts, particularly the authentic autobiographical information of Vagbhata, can scarcely be reconciled with this identification. (4) According to Cordier l. c. in the 13th century, still the dates collected by him speak for still earlier composition. For an old commentary of Candranandana (not Candrananda) quoted by Arunadatta, see Cordier, l. c. (5) Edition of Ganesh Tarte (Bombay 1888, 2 Vols. pp. 6, 306, 421). (6) Cf. Laufer, *Beitr* 1, 13.

§ 7. **Atreya-Harita** :—Ātreya i. e. the son of Atri, also called Punarvasu, is unquestionably one of the most famous medical Ṛsis. Thus he is called in the Bower MS. 1.8. as the first of the wise men of old times engaged in the search and testing of medicinal plants; so also in AS 1.1, AHr. 1.1.2, and Car 1.1.9. Immediately after Ātreya, Hārīta is mentioned in the Bower MS. The hypothesis that the oldest medical work is preserved in the Saṁhitā ascribed to Ātreya or Hārīta appears to be resting on firm ground[1]. On the other hand, the name alone is not convincing enough and several modern falsifications[2] in the domain of legal literature are concealed especially under the respected names of Ātreya and Hārīta. Haas regards the medical Ātreya Saṁhitā as "the most miserable scribbling in this domain[3]". Still both the arguments which he advances for this harsh judgement, namely the theory of karmavipāka (cf. § 3) and the use of various substances (see Kauśika sūtra) causing nausea are already peculiar to the Vedic medicine. Indeed Hārīta says at the end of his work that in the four eras (Yugas) Atri, Caraka, Suśruta and Vāgbhaṭa were the standard authors and consequently betrays hereby his acquaintance with and the anteriority of Vāgbhaṭa. The genuineness of this concluding part can, however, be challenged, since the text of Hārīta is in general very badly preserved, the MSS as well as the printed text differ to a great extent and a commentary and old dated MSS appear to be wanting[4]. The complete work requires a closer examination; it nevertheless contains in its six sthānas which are of unequal extent a complete system of medicine with many peculiar statements on diseases and therapeutic substances which are often used in later texts, though with precaution.

(1) Goldstucker in Mrs. Manning's *Ancient and Mediaeval India* (London 1869) 1,339-42 where a short extract from Harita is given. Sinhjee has expressed analogous views (p.29). (2) *Recht und Sitte* § 81. (3) ZDMG 31, 650. (4) Cf. IO 929 and both the editions, essentially differing from each other, by Binod Lal Sen (Calcutta 1887, pp.32, 420) and Jairam Raghunath (Bombay 1892, with Gujarati translation, pp. 39, 812). Still more different from these is the Atreyasamhita described in L. 2633. cf. also Cordier, *Origines*, 83.

§ 8. **Susruta :—** The Bower MS (§ 13) shows that Suśruta, like Ātreya and Hārīta, was respected not only as one of the oldest Ṛṣis in the field of medicine in the fifth century, but also as the mythical author of a work on garlic and other therapeutic substances, the contents of which (as well as of the other medical works of the Bower MS) stand in close relation to those of the well known Suśruta Saṁhitā (Āyurvedaśāstra) composed by Suśruta, son of Viśvāmitra. In the interior parts of India the name of Suśruta was proverbial as that of a distinguished Vaidya at the time of king Yaśovarman of Kamboja (889–910), as is shown by the play on words in the inscriptions of this king[1]. About 900, Suśruta was cited in an Arabic translation of the famous Arabian physician Razi (Rhazes) in such a way that one feels that this translation could well have been based on Suśruta Saṁhitā[2]. The Indian-Arabic work of Sanaq on poisons (Circa 910–20) strongly reminds us of Su. 5.1.[3] Barmakide Yahya Ibn Chalid (C. 805) who was descended from Buddism had already ordered for the translation of Suśruta. The accounts of the Chinese traveller I-tsing (cf. § 10) also prove the existence of a work similar to our Susruta at least in the 7th century. The dates adduced in § 5 f. to which the mention of Susruta in the Mahābhārata may be added, are affirmed by this external evidence.

The present condition of the whole Suśruta is indeed borne out[4] by the commentaries, especially the Bhānumatī of Cakradatta (11th cen.) and the Nibandhasaṁgraha of Ḍallaṇa (12th cen.). Jaiyyaṭa (Jaijjaṭa) is usually considered as their oldest predecessor[5]. On the basis of his commentary Candraṭa, son of Tīsaṭa (cf. § 3) undertook a revision (Pāṭhaśuddhi) of the text of Suśruta[6]. We can also gather from Ḍallaṇa (e. g. on Su. 3.2.48–49) that Jaiyyaṭa read differently in many places and in general great discrepancies existed in the MSS. According to Hoernle many original readings can still

be restored from Bhānumatī. The text-critical problems are often very difficult. Thus from Su. 1.1.39 and 1.4.5 one can draw the conclusion that originally there were 120 adhyāyas in five sthānas and that the last part (Uttarasthāna) is a later addition. The AHr also consists of 120 adhyāyas if the Uttarasthāna is reckoned. Even the AS has such a sixth part. The absence of opium among therapeutic substances, of pulse-feeling in medical examination and of small pox in special diseases speaks for the high antiquity of our work. The medicaments are mostly of vegetable kind and a few references to quicksilver remedies[7] are probably interpolations. The language mixed with prose and poetry is not so old as in Bower MS and reminds us much more of Varāhamihira (6th century) but can also have been modernised.

The Anukramaṇikā in Su. 1.3 gives information about the contents. The first part (Sūtrasthāna) is basic and deals with general questions like the origin and division of medicine, training of physicians, theory of therapeutic substances, dietetics and similar things. It also especially deals with surgery and treatment of wounds which, according to Suśruta, form the most important part of medicine, wherefor Dhanvantari— the surgeon of Gods is considered as its real author. The second (Nidānasthāna) deals with pathology, the third (Śārīrasthāna) with anatomy and embryology, the fourth (Cikitsāsthāna) with therapy, the fifth (Kalpasthāna) with toxicology, the sixth supplementary part (Uttarasthāna) with opthalmology and other portions of therapy not described previously as well as with hygiene etc. in short[8].

(1) Bergaigne. *Insc. Sanscrites de Campa et de Cambodge* (Paris 1893) 2, 218, 227; Lietard. *Susruta* (Dict. Encyclop. des Sciences Medicales). (2) According to the third improved reprint of Jiva. Vidyasagar's edition (Calcutta 1889, pp. 12, 915). For other editions (first edition, Calcutta, 1835 ff.), see the Catalogue of Haas-Bendall and Rost and the OB. (3) A Muller, ZDMG, 34, 475, 544 ff. (4) Bhanumati and Nibandhasamgraha together in the editions of Gangaprasad Sen (15 parts upto Su 1.43.5, Calcutta 1888 ff., pp. 648, the edition used in Hoernle's translation) and Bijayaratna Sen and Nishikanta Sen (14th part, 1893). A complete edition of Nibandhasamgraha published by Jiva. Vidya (Calcutta 1891, pp. 1377, thereon see Roth, ZDMG 49, 138-40). Another edition of Susruta with the same commentary is published upto Su 4.20.4 by Abinash Chundar Kaviratna and Chundar Kumar Goopta (Calcutta 1885 ff., pp. 1074). (5) Cf. Roth l. c. 139, Hemadri. IO 932. (6) IO 928 (7) Cordier, *Quelques donnees nouvelles* 2; Jolly, ZDMG, 54, 263. (8) Translations : Hessler, *Susruta* (Erlangen 1844 ff., 3 Vols. and 2 parts, pp. 206, 208, 186, 24, 10, 106), Latin; not available. Cf. Weber, IStr.

2,87-90; A.M. Kunte, *Caraka edited and Susruta translated* (Bombay 1876ff., pp. 216, 68 upto Su. 1.8) Cf. Weber l.c. 3, 561-93; *The Susruta Samhita* trans. by U. C. Dutt (Calcutta 1883 ff., Bibli. Ind. pp. 192 upto Su 1.42); supplemented by A. C. Chattopadhyaya (Calcutta 1891, pp. 193-288, upto Su 1.46); *The Susruta Samhita* translated by A. F. R. Hoernle (Calcutta 1897, Bibli. Ind. pp. 98, upto Su 1.14). Compare also Haas, *Über die Ursprunge der indischen Medizin, mit besonderem Bezug auf Susruta*, ZDMG 30, 617-70; by the same author, *Hippokrates und die indische Medizin*, l. c. 31, 647-66; Weber, ILit[2] 286, Nachtr. 13; A. Muller l.c. 464-556; Dutt, *Mat. Med.* VIII ff.; Lietard, *Susruta* (see above); Cordier, *Nagarjuna et l'Uttaratantra de la Susrutasamhita* (Anantarivo 1896, pp. 7).

§ 9. **Caraka** :—In Chinese sources Caraka appears as the court-physician of the famous king Kaniska (circa 100 A. D.) whose wife he attended as an obstetrician in a difficult delivery. The Arabic sources also know Caraka as a medical author whose work was translated first from Indian into Persian and then (c. 800) from Persian into Arabic[2]. What Alberuni quotes from Caraka according to this translation, e. g. his relation to Agnivesa and the origin of Āyurveda[3], agrees with our Caraka. According to the Indian tradition which Alberuni also knows, Caraka is the oldest author[4]. Vāgbhata, therefore, forms the compound *Carakasnárutau* (not vice versa). In Bhāvaprakāśa Caraka is a mythical figure, older than Dhanvantari—the physician of Gods, and also than Suśruta. The Prasthānabheda also mentions Caraka before Susruta (IS. 1.21). Hārīta (§ 7) places Caraka, Susruta and Vāgbhaṭa who are also denoted as Vṛddhatrayī, successively in the latter three eras. Outside the medical literature Caraka is three times cited by the grammarian Bhartṛhari who, according to I-tsing, flourished before 650 A. D.[5] The name Caraka reminds us of the old Vedic school of Caraka (Cf. also ' Kapiṣṭhala ' Car 1. 1. 9). Thus chronologically very little can be said against the identification of Caraka with Kaniska's court-physician.

The commentary Āyurvedadīpikā or Carakatātparyaṭīkā[6] composed by Cakradatta in the 11th century directly bears testimony to the present form of Carakasaṁhitā, just as is the case with Suśruta. The older commentary of Haricandra or Hariścandra which is quoted by Cakradatta and other old authors is apparently lost. In spite of the old commentary the text has been handed down in a worse condition than in the case of Suśruta, as is evident from great difference between the MSS and the available numerous editions. The last two sthānas and

the concluding part of the fifth (41 Adhyāyas in all) do not come from Caraka himself, but are supplemented by Dṛḍhabala born in the Panjab (*Pañcanada*) " from many books[9]". As a whole, however, the Carakasamhitā by its form and contents makes even more antique impression than the Susruta Samhitā. It exceeds the Suśruta Samhitā in extensiveness in spite of the complete absence of surgery, which fact is explained by its naive width and looseness. Caraka has in common with Susruta his terminology and general views, the interchange of prose and poetry, the absence of opium, pulse-feeling and the quicksilver preparations. He has the archaic expression *Rājamātra* in common with the very old Macartney MS[10].

Caraka himself gives a survey of the contents of his work in 1.30. The work consists of eight sthānas[11] :— 1. Sūtrasthāna deals with pharmacology, food, dietetics, certain diseases, curing methods, physicians and quacks, also physiology, philosophy and other things of the most varied character. 2. Nidānasthāna deals with eight main diseases. 3. Vimānasthāna deals with taste, nourishment, general pathology and medical studies. 4. Śārīrasthāna contains anatomy and embryology. 5. Indriyasthāna on diagnosis and prognosis. 6. Cikitsāsthāna on special therapy. 7. Kalpasthāna and 8. Siddhisthāna on general therapy[12].

Bheḍa or Bheḍasamhitā[13] which is not yet printed, is very closely related to the Carakasamhitā; perhaps it is as if another recension of this work. Caraka himself is only an elaborator of an old work composed by Agnivesa who was a fellow-student with Bheḍa (Car 1.1). Bheḍa is mentioned in the Bower MS. 1.8.

(1) S. Levi, *Notes sur les Indo-Scythes*, JA 1896, pp. 447, 480 ff.; Lietard, *Le Medecin Caraka*, Bull. Acn. Med. 1897; Jolly, *Caraka*, WZKM 7, 164-66; Takakusu, *I-tsing* (Oxford, 1896) LIX. (2) Cf. Flugel, ZDMG 11, 149, 325 ff.; A. F. Muller, l. c. 34, 475, 554 ff.; Sachau, *Alberuni's India* Pref. xxxi, xxxv. (3) Sachau, l. c. 159, 162 ff., 382 ff. (4) Cf. Dutt, *Mat. Med.* VI ff. (5) Kielhorn, IA 12, 227. (6) According to the edition of Sriharinath Visarada (Calcutta 1892 ff., pp. 533, 2, 32) covering the Sutrasthana and Vimana. 1-3, 8 and also according to both the Tubingen MSS (Garbe, Verz. 145 ff.). (7) CC s. v. (8) The citations refer to the edition of K. Debendranath Sen and K. Upendranath Sen (Calcutta 1897, pp. 42, 1056) which presents at least a readable text. The work of Jiva. Vidya. is much improved in the second edition (Calcutta 1896.pp. 931). The good and fully

commented Editio Princeps of K. Gangadhara (Calcutta 1868 ff., pp. 1200) was printed upto Car 1. 18 and was completed by Dharanidhara Ray (Berhampore 1878 ff., pp. 1588, 4). For Kunte's edition upto 1.30 see § 8; for other editions and translations in modern Indian languages see OB. (9) Car 6.30.275; 8.12.78-9. Cf. Dutt, *Mat. Med.* VII; Cordier, *Origenes, Evolution et Decadence de la Medicine de Indienne* in *Annales d'Hygiene*, 4, 81 (Paris 1901) (10) Hoernle, *Central Asian MSS*, JASB 1897, p. 247. (11) Not of 11, Cf. Roth. ZDMG, 26, 443. (12) The very extensive translation by Avinashchandra Kaviratna comprises uptill now 20 Vols (Calcutta 1891-99). Cf. Roth, ZDMG 48, 140-42. Roth himself translated Caraka 5.8 and 1.29 in ZDMG, 26, 441 ff. A trans. commenced by Mahendralal Sarkar in 1870 in Calcutta Journal of Medicine did not go beyond adhyaya 2. Cf. also Goldstucker, l. c. 242-45; Weber, ILit[2] 284 ff.; Eggeling, IO, 923 ff.; Cordier, l. c. 79 ff. (13) Burnell, 63 ff.; Cordier, l. c. 80 ff.

§ 10. **Origin of Ayurveda** :— The Āyurveda, the Veda of long life, of therapeutics, was first known from Brahman according to the tradition just mentioned. From Brahman, Prajāpati or Dakṣa received it, from him it came to the Aśvins and from them to Indra. So far the accounts agree[1]. Further according to Suśruta, Indra taught Āyurveda to Dhanvantari (i. e. the Professor of surgery), the surgeon of Gods embodied as king Divodāsa of Banaras (Kāśīrāja). Divodāsa then transmitted it to the wise men who approached him as pupils, out of sympathy for the suffering humanity and also in order to prolong their own life; really however, he taught Āyurveda to Suśruta along with his six companions, with special reference to surgery. On the other hand, Bharadvāja is, according to Caraka, the first human being to whom Indra exposed the Āyurveda. Out of more than 50 Ṛṣis who surrounded him and whose names do not agree with Suśruta's companions, Punarvasu, son of Atri (Ātreya), transmitted the science obtained from Bharadvāja to his six disciples : Agniveśa, Bheḍa, Jatūkarṇa, Parāśara, Hārīta and Kṣārapāṇi. Of these Agniveśa first composed a text, then the others also compiled theirs, and these six books obtained the assent of Ātreya and other wise men and general recognition in the world. At the end of every Adhyāya it is, therefore, said that this work is composed by Agniveśa and is revised (*pratisaṃskṛta*) by Caraka. AS and AHr also substantially agree with Caraka's version of the legend which Alberuni also knew (Cf. § 9). According to AS and AHr, Ātreya and his companions were directly taught by Indra. In AS the names of the five companions of Agniveśa are partly different and Suśruta is mentioned as one amongst them.

In Bhāvaprakāsa, Ātreya with his six disciples appears (as in Caraka) after the Gods, then Bharadvāja, then Caraka who elaborated the books of Agnivesa and his associates, then Dhanvantari who was king of Banaras (Kāsīrāja), lastly Susruta who, inspired by Dhanvantari, wrote a text-book which is called Suśruta, because it is *suśrutam*. The Prasthānabheda also mentions Caraka as the first of the human authors, whose eight *sthānas* it knows, then it also mentions Suśruta who wrote a book in five *sthānas*[2]. Much simpler is the account in the first medical work of the Bower MS which puts this work in the mouth of the sage Kāsīrāja who was questioned on the nature of garlic by Susruta botanising in the Himalayas along with nine companions, among whom there were Ātreya and Bheḷa.

Caraka, Suśruta, AS and AHr also agree on the point that they all hold the original *Āyurveda* which is an *Upāṅga* of Atharvaveda, to have consisted of eight parts : Surgery (*Śalya*), surgery of eye, ear, nose, throat (*Śālākya*, *Ūrdhvāṅga*), demonology (*Bhūtavidya*, *Graha*), treatment for children (*Kaumārabhṛtya*, *Bāla*), toxicology (*Agadatantra*, *Viṣagaravairodhikapraśamana*), elixir (*Rasāyana*, *Jarā*) and aphrodisiac (*Vājīkaraṇa*, *Vṛṣa*)[3]. In Caraka, AS and AHr, *Kāyacikitsā* is the first part. The Chinese traveller I-tsing (671–695 A. D.) knew those eight parts of Indian medicine in the order in which they are mentioned in Suśruta, and when he says that these eight arts existed originally in eight books but were lately brought together by a man, so this remark can be taken as based on the above Indian account, especially because he mentions Śakra (Indra) as the first author[4].

Whether and how far this tradition possesses a historical kernel, cannot at present be decided. Su 1.1.6 says that the original work of Brahman was composed in 100,000 verses and 1000 chapters and was reduced to those eight parts only in view of the limited grasping power of men. This account has a striking similarity with the original Manusmṛti which is said to have consisted of 100,000 verses and was reduced to its present extent gradually in successive manipulations[5]. The close relation of Susruta to surgery did not exist originally, as the Bower MS shows.

(1) Car, Su, AS, AHr 1.1; Bhav 1.1.1-9. Cf. Harita 1.1. (2) Weber IS I.21. (3) Su, AS, AHr l.c. & Car 1.30.25. (4) Takakusu, l. c. 127ff., 134, 222 ff. (5) *Recht und Sitte*, § 7.

§ 11. **Medical Glossaries :—** The pharmaceutical collections form an important part of medical literature, but are already dealt with by *Zachariae* as a part of lexicography[1]. Here, therefore, only a small supplement from the pharmaceutical point of view may be given. Even though Dhanvantarinighaṇṭu[2] is the oldest work of this kind, it cannot be very old, for it seems to be familiar with the pharmacological working and therapeutical use of quicksilver and other metals as well as with the philosopher's stone. Thus seven other names are given to quicksilver (*Pārada*) (p.213); it cures worms and leprosy, prolongs life, strengthens the eyes and so on only in torpid condition (*Mūrcchita*), while in its natural form it brings death (p. 214). There are five kinds of Ferromagnets, the Roman (*Romakānta*, p. 211) being one among them. In the *Suvarṇādivarga* the following metals and minerals are classified according to their good and bad effect : Gold, silver, copper, zinc, brass, lead, white brass, iron, damasked steel (?), iron filings (?), quicksilver, cinnabar, artificial diamond, emerald diamond. Among the plant substances, the opium (*Aphūka*, *Ahiphena*, *Aphenaka*) and poppy seed (*Khastila*) are mentioned (p. 232). Compare § 26. In the *Madanavinoda* of Madanapāla[3] composed in 1374 A. D. and also in the later *Rājanighaṇṭu* of Narahari[4] a large group of other minerals is likewise mentioned along with the abovementioned minerals. For some later medical Glossaries, see above §§ 1 f., 4 f. One may well suppose that the enumeration of articles of food and therapeutic substances, their grouping in *Vargas* and the statement of their *Guṇas* in Car, Su, AS, and AHr originated from the medical glossaries, but the preserved works of this kind appear throughout to be of a later date than the old medical Saṃhitās. To these Glossaries may also be added the dietetic works like *Pathyāpathyanighaṇṭu* of Trimalla (printed in Banaras 1869), *Pathyāpathyaviniścaya* of Viśvanāthasena (16th century ?) and the medical cooking books like *Kṣemakutūhala*, *Bhojanakutūhala*[5],

(1) Grundr. 1. 3b § 27. (2) ASS. 33 (with Rajanighantu, Poona 1896 pp. 440, 165). (3) Edn. Jiva. Vidya. (Calcutta 1875, pp. 141) (4) Cf. Aufrecht, ZDMG, 41, 487; Garbe, *Die Indische Mineralien* (Leipzig 1882) and Verz. No. 174. (5) Cf. Aufrecht, ZDMG 51, 329; L. 2939; IO. 97 f., Burnell 72 f.

§ 12. **Veterinary Science :—** This branch of medicine, not treated in the text-books of Āyurveda, refers particularly to elephants

and horses on which the king possessed a monopoly[1]. Megasthenes informs of the treatment of the elephants with the insertions of milk for the inflammation of the eyes, with black wine in other ailments, with warm water and hog's flesh and butter for wounds[2]. King Asoka (3rd Cen. B.C.) was proud in his inscriptions of the arrangement of animal hospitals (*Paśucikitsā*) in the whole of his empire, such as they are founded by the Jains at present[3]. King Buddhadatta of Ceylon (4th cen. A. D.) is reported to have maintained physicians both for his troops as well as for his elephants and horses[4]. In Pancatantra (5.79, Bühler's edn.), a dictum of Śālihotra on the treatment of burning wounds of horses with the fat of monkeys is adduced. Indian works on veterinary science appear to have been translated early in Tibetan and Arabic. In 1030 A.D. Alberuni quotes from an Indian book on elephant-medicine; a work on horse-medicine was alleged to have been translated into Persian in the 14th century, another one in the 17th century, and from that in English in the 18th century (by Earles, Calcutta 1788)[5]. *Hastyāyurveda* of Pālakāpya is now available in print; it deals in four sthānas[6] with difficult, easy and surgical diseases and the therapy of elephants. There is also Jayadatta's shorter *Asvavaidyaka* or *Śālihotraśāstra*, a treatise on horse-medicine in 68 Adhyāyas. *Asvacikitsā of Nakula*[7] is another work on the same subject. The *Asvavaidyaka* is composed in later middle age, for opium is alluded in it; on the other side there exists a MS of 1424 A.D. There is also a Nepalese MS of Aśvacikitsā[8] written in 1364 A. D. The nomenclature and treatment of diseases (e. g. Kuṣṭha) is similar to other medical works. In a similar manner there is a *Vṛkṣāyurveda* on the care and diseases of trees[9].

(1) *Recht und Sitte* 111. Cf. Megasthenes (Schwanbeck) Fr 36. SBE. 17, 85. (2) Megasth. Fr 36-8. (3) Buhler ZDMG 37, 95-102. (4) Mahavamso 37, 97-100 (Colombo edition according to Geiger). (5) W. 291; Sachau, *Alberuni*, Pref. xxxiv, xl; Haas, ZDMG 31, 663 ff.; Huth, l. c. 49, 281; IO. 989. (6) ASS. Poona 1896, pp. 717. (7) Bibll. Ind. Calcutta 1886, pp. 12. 335, 15, 46, 63. (8) IO. 989, Asvavaid. Glossary 2, JRAS 20, 550 (1888) Cf. also the *Addenda*. (9) Oxf 324 f.

§ 13. **The Central-Asiatic MSS.** :— The famous *Bower MS* found in a Buddhistic Stūpa in Kashgar (China) is probably written by travelling Hindus in the Indian Gupta script about 450 A. D. according to palaeographic criterion. The writing material is birch-bark lengthwise cut like the South and West Indian palm-leaves. Of

the seven Sanskrit texts contained in this MS three are purely medical. The first medical book contains first of all a panegyric on garlic (*Lasuna*), then various recipes, particularly for eye-diseases. The second and more extensive work called *Nāvanītaka* (i. e. quintessence) deals in 14 Adhyāyas that are preserved, with powders, butter decoctions, oils, mixed recipes, *basti*, elixirs, broths, aphrodisiacs, eye-ointments, hair-dyes, *Terminalia Chebula*, bitumen, plumbago zeylanica and childwelfare.The third work contains 14 medical formulae in only 72 verses. The sixth text, a serpent-spell against the bite of cobra, has also a medical character. The language of these texts is older than that of Caraka and Suśruta. Hoernle deserves thanks for the arduous but nonetheless completely successful decipherment and translation and careful edition of the MS furnished with photographic fascimiles and explanatory remarks[1].

Hoernle has also commenced the editing of other MSS found in the same region, which also mostly contain Indian recipes or spells and are partly still older than the Bower MS. Thus in the *Macartney MS* written about 350 A.D., a paper MS unfortunately preserved in a bad condition, there occur the names of several known medicinal plants like *Arka*, *Priyaṅgu* and the metals gold, silver, iron, copper and zinc[2].

The great importance of the Bower MS for the history of Indian Medicine lies in the fact that it has certainly proved the existence of the Indian Medicine already in the 4—5th century A. D. and thereby has removed all doubts about the faithfulness of Arabic accounts. The doctrine of Tridoṣa, of digestion, of the influence of seasons, the forms of medicinal substances, the names of diseases, appear here essentially the same as those in the works hitherto mentioned and many long recipes of the Bower MS recur word by word in the medical Saṃhitās. Quicksilver, opium as well as small pox do not appear herein.

(1) *The Bower MS* edited by A. F. R. Hoernle, parts I-VII (Calcutta 1893-7, vi, 240, 54 plates). Cf also Hoernle, Proc ASB 1891, April, 54-65; IA 21, 29-45, 129-45, 349-69; JASB 60, 1, 79-95; 1, 3, 135-95; Buhler WZKM 5, 103-10 302-10 AC 40, 138 f.; JRAS 1891, 689-94; Palaeogr § 22; Jolly, ZDMG 53, 374-80 und *Festgruss an Roth*, 18 ff.; Oldenberg, Zap 12, 8-36 (2) Hoernle Proc ASB 1894, 64 ff.; *The Weber*

MSS. JASB 62, 1. 1, 1-40. *Three further collections* JASB 66, 1, 213-60. *A collection of antiquities from Central Asia*, JASB 68, xxxii p. 110. A Note presented to the XIIth Congress (Oxf 1899). An epigraphical note, JASB 69, 1. 2, 93-134. Weber MSS part IX (s. 1.)

§ 14. **Buddhistic Works:**— The Bower MS comes from the Buddhists as is precisely shown by the several references to Bhagava, Tathāgata, Buddha etc. in the 6th and 7th parts. Traces of Buddhistic tendency are found in Vāgbhaṭa (Cf.§ 5) and this explains its transplantation to Tibet; besides the whole-hearted reception of Indian medicine in Tibet (§ 16) leads to conclude the existence of a Buddhistic medicine in India. The detailed statements of the Buddhist I-tsing (671–695 A. D.) on the condition prevailing at that time of Indian medicine (medicinal herbs, the Tridosa, diagnosis, fasts etc. cf. also §10) agree with the contents of our Caraka and Susruta, as well as of the Bower MS; I-tsing even quotes from a sūtra on medicine[1] preached by Buddha himself.The Buddhist king Buddhadāsa of Ceylon (4th century A.D.) cured the ill, maintained physicians (cf. also § 12) whom he extended special grant,erected asylums and wrote the medical work Sāratthasamgaha[2]. Caraka is said to have been the court-physician of the Buddhist king Kaniska (circa 100 A. D. Cf. § 9) and the well known Nāgārjuna who is placed in the same period is said to have composed, along with other medical works, an elaboration of Susruta, since a recipe engraved on a column in Pāṭaliputra is attributed to him[3]. King Asoka established hospitals for men and animals (3rd century B. C.) and the old Buddhistic medicine of Mahāvagga[4] (4th century B. C. ?) knows the Tridosa, eye-ointment, nasal remedy, horn-scarifying, fomentations (*Svedana*), oils, *Ghṛta*, lotus-stalks, myrobalans, different kinds of salt, *Asafoetida*, garglings, maggots in head and even the laparotomy mentioned in the later works; it,however, knows no metallic preparation.

(1) Takakusu, l. c. 126-40. (2) Turnour's *Mahavamso* 243-45, Colombo edn, 37,62 ff. Geiger, Grundr.1-10, §1. (3) Dallana on Susruta 1.1. Cordier, Nagarjuna (1896); Jolly, ZDMG 53, 378. (4) 1.6,1.8, (Edn. Oldenberg), SBE 17. 47 ff.

§ 15. **Vedic Medicine** :— This preliminary stage of medicine is already presented in Bloomfield's Atharvaveda in this Grundriss[1]. Hillebrandt has also given a survey of the Vedic spells against diseases[2].

Here, therefore, some recent works may be recorded and the relation of the Vedic to the later medicine will be briefly discussed.

Caland has contributed to the general knowledge by the treatment and explanation of the Kauśika sūtra in his important work on *Altindisches Zauberritual*[3], an interesting but nonetheless difficult book and has compared the Indian folk-medicine with similar ideas and manners of the North American Indians, the old Romans and Germans and other peoples. These often surprising parallels do not rouse any high opinion about the Vedic medicine. The Kauśika sūtra resembles the spell-books of the North American Indians so much so that one may easily mistake one for the other. The utterences and invocations of the Atharvans are, however, to be considered as the base of the later medical science[4]. Winternitz also came to the conclusion in a short but comprehensive presentation of the ancient Indian folk-medicine that in India, as elsewhere, the physician is the direct descendent of the sorcerer and magician[5]. Very early a French physician, Dr. P. Cordier, has carefully collected and discussed the medical passages in the Ṛgveda, Atharvaveda as well as in the Upanisads, epics and law-books[6].

In the medical Saṁhitās themselves the Atharvaveda is often mentioned. Thus Su. 1.1.6 denotes the medical science as a supplement (*Upāṅga*) of the Atharvaveda while it is also called an *Upaveda*[7]. The reference to 101 kinds of death of the Atharvans in Su. 1. 34.6 appears to be a direct quotation from AV. VIII. 2.27[8]. According to Car. 4.8.32 a Brahman well versed in Atharvaveda must ward off by Śānti the demonic influences in *Sūtikāgṛha*. It is significant that Car. 4. 8. 30 recommends for the still-birth either medical treatment or magic spell and similar methods directed in AV. AHr 4.5.83 prescribes at the end of a long list of remedies also *Atharvoktam* i. e. sacrifice etc. (Arunadatta) for consumption. The magic spells of AV. appear also as frightful exciter of diseases, thus Su. 1. 24. 7, AHr 6.39.53. One must also presume that long before the compilation of medical Saṁhitās, a controversy had developed between the Brahmans knowing Veda and magic and the caste of physicians (*Vaidya, Bhiṣaj, Cikitsaka, Ambaṣṭha*) appearing in Manu.

From the point of view of contents also there is correspondence between Vedic and later medicine; thus there is similarity in the names

of diseases[9], of course with the important exception of fever (Jvara = Vedic *takman*), in the names of healing plants which play a great role in the Veda along with incantations[10], in the physiological conceptions which, particularly those occurring in the Upanisads,[11] are very similar to the later conceptions. Further transitional stages are formed by the Buddhist medicine, e. g. the serpent-spell in the Bower MS exactly reminding of the AV, as well as by the Gṛhya and Dharma sūtras which actually show literal agreement with the medical works in the description of the Saṃskāras, hygiene, embryology, anatomy and the doctrine of rebirth and by both the epics and some Purāṇas.

(1) Grundr. II, 1b,§ 50-3. (2) Grundr. III, 2.§ 92. (3) Amsterdam 1900, pp. xii, 196. Grundr. 8. Cf Oldenberg,DL.6 April 1901. (4) l.c. ix.67. (5) Nature, 7th July 1896,233-35 (6) *Etude sur la medecine Hindoue (Temps Vediques et historiques)* Paris 1894, pp. 116, V. 4. (7) Weber. IS I. 9. 20. (8) Cf. Peters. Dict. s. v. *Atharvan*. (9) Bloomfield SBE 42, Index s. v. *Diseases*. (10) l. c. s. v. *Plants and trees*, Caland, l. c. 187 ff. List of Plants. (11) Cordier, l. c. 37 ff.

§ 16. **External Relations** :— A continuous exchange in the domain of medicine with the neighbouring people cannot be doubted, but regarding the kind and extent of these relations very little has so far been determined.

1. Tibet :— H. Laufer's excellent *Beitrage zur Kenntnis der Tibetischen Medicin*[1] gives a good review. From the "Four Tantras" translated (Sanskrit original unknown) in the 8th century onwards a lot of medical Sanskrit texts have been translated into Tibetan.The Tibetan medicine is,therefore,mostly based on the Indian medicine.For example, 9 openings of the body and 900 nerves are from anatomy,the theory of Tridosa is carried to its logical conclusion, the harmfulness of the combination of milk and fish as well as the suppression of natural discharges are mentioned under dietetics, the three myrobalans, the blue lotus (*Utpala*), black pepper, garlic, ginger, cinnamon, root of costus (*Kuṣṭha*) are referred to in pharmacology, the scarification with the horn of ox, the designation of instruments as milletcorn, bird's beak, mouth of animal etc. are mentioned in surgery, the symptoms of the sex of foetus are given under the diagnosis of pregnancy. Several Tibetan works are translated into the Mongolian. The Tibetan

medicine is used by Burjats, Dsungars, Tanguts, Wolgakalmuk as also by the Leptscha and other Tibetan people of the Himalayas[2].

2. Ceylon :— Buddhism had brought medicine to Ceylon still earlier than to Tibet. However, apart from the *Sāratthasaṁgaha*[3] (§ 14) known only from the continuation of the Mahāvamso, the Yogārnava (13th century A. D.) appears to be the oldest medical work[4]. The modern Simhalese publications[5] and the Simhalese MSS on medicine[6] at the British Museum appear to be based throughout on Sanskrit models.

3. Burma :— Although the fame of Susruta had spread about 900 A.D. from Western India to Kamboja (cf. § 8), Susruta, Dravyaguna and other medical works were directly translated from Sanskrit into Burmese in the 18th century. The technical terms in Burmese medicine are also derived from Sanskrit[7].

4. Persia and Arabia :— From the Aryan antiquity originated particularly the oldest Indo-Persian terms for physician and medicine (Bhisaj—*Bisiṣk*, Bheṣajam—*baeṣazem*), for magic spells (mantra—*mathra*), some names of diseases and the most common names of parts of human body. Further, we find the Bactrian physician Kānkāyana (*Bāhlīkabhiṣaj*)[8] referred to in Caraka (1. 12. 5, 4. 6. 21 etc.) as well as in the Bower MS (2. 935). The Persian medicinal substance *Pūrastyayavānī* (Cf. § 5) is mentioned in Siddhayoga. Earlier than that Hingu (*Asafoetida*) occurring in Susruta and other works as well as the orange (*Nāraṅga*) must have been imported from Persia. In the middle age (see § 3) the calcination and extensive therapeutic use of quicksilver and other metals, the opium, the root of Beriram, the feeling of pulse in medical examination appear to have reached India from Arabia or Persia. Later imports of medicinal substances from Persia need not be considered here. On the other hand, Indian works on medicine were translated into Persian already in the time of Abbasians or perhaps of the Sassanians. These are not available at present. Then followed Arabic translations. Except Caraka and Susruta, the names of translated Indian authors are difficult to identify. Yet the Arabic accounts of the contents of these works and quotations therefrom in Razi and other Arabic writers show that they deal with purely Indian product[9]. Very much Indian material

is found in the preserved Persian work of Abu Mansur Muwaffaq on pharmacology (10th century). The author himself had made a scientific journey in India and cites much from Indian works[10] which are indeed unknown.

5. Greece:— The Indian elements in the materia medica of Dioskorides and earlier authors can be easily ascertained; e. g. *πιπερι–pippali* *πεπεριοςρίζα – pippalīmūla*, Costus–*Kuṣṭha*, *ζιγγίβερις – Śṛṅgavera*, *καρδάμωμος – Kardama* (elā), *κιννάμωμος – tvacā*, *ἄκορος – vacā*, *βδέλλιον –guggulu*, *κύπειρος–mustāka*, *σάκχαρον–Śarkarā*, *σήσαμον–tila*, etc.[11] Still more difficult it is to explore the origin of many further analogies between Indian and Greek medicine[12]. To quote for example:– the accomplished humoral pathology (Cf. § 33), the raw, ripening and the ripe stages of fever (Cf.§ 51), ἀπεψία, πέψις and some corresponding to the tumour (Cf.§69) and other ailments,the division of healing remedies into hot and cold (Cf.§ 23),also in dry (*rūkṣa*) and oily i. e. moist (*Snigdha, picchila*), the healing of diseases by remedies of opposite character, the purely Hippocratic emphasis on prognosis (Cf. § 21), the characterization of the physicians and the directions given to them reminding us of the oath of the Asclepiads, the influence of seasons in dietetics,the recommendation of spirituous drink contrary to the religious view of the Indians, the quotidian, tertian and quartan fever, *Kṣaya*–phthisis (Cf. § 61) etc. in individual diseases, keeping in check the heart-troubles in negative bearing (cf. § 63), the often occurring sensation of creeping round of ants on the body in respect of symptoms, the eating of earth in chlorosis (cf. § 59), the symultanaeous formation of all parts of body in the doctrine of development and midwifery, the birth of twins by the division of quantity of semen, the relation of the right part of body to the male sex of the foetus, the vitality of foetus in the 7th month and the contrary in the 8th (cf. § 41), the dismembering of the dead foetus and its extraction with a hook fixed in the eye-sockets (cf. § 48), the movements for the advancement of placenta (cf. § 42), the method of lithotomy in surgery (cf. § 57),the paracentesis in dropsy (cf. § 54), branding, cauterizing and cutting of hemorrhoidal tumours (cf. § 76),bleeding,leeches (among them those coming from Greece, *Yavana*, Su. 1. 13. 13) and cauteries (cf. § 29 ff.), many surgical instruments (cf. § 28) the operation of the right eye with the left hand and of the left eye with

the right hand and other details of the operation of the cataract (§83) in opthalmology. A fragmentary MS (in the 1st cen. A.D.?)[13] having the form reminding us of the papyrus-roll is preserved besides the manifold Greek coins minted in India. That in the period when Greek influence was predominant in India as indicated above, certain medical writings of the Greeks might have found admission in India is indeed as easily possible as the Greek astronomy and astrology were, as is well known, received in India[14]. Yet we must not overestimate the Greek elements. The humoral pathology which in its developed form reminds us of the Greek one,can also be connected with the harmony of the three Gunas of the Sāmkhya philosophy and can be proved as early as the origin of the conception of the Gunas (Cf. § 33). The Greek influence must have been the most strongest in the field of surgery. It is also to be noted that the Bower MS and Caraka contain nothing of surgery. In later works also surgery completely receded to the background.

(1) Two parts, pp. 41, 90 (Berlin, Leipzig 1900). (2) l. c. 15. Cf. Lietard, *Hist. de la Med.* 38ff. (3) On an apocryphal work of this name see Geiger, Grundr. 1. 10. § 1. Cf. also Ainslie, *Mat.* 2, 525 ff. (4) Geiger, § 5. (5) Haas, ZDMG 30, 631. (6) Wickremasinghe, *Cat. Sinhal. MSS.*, British Museum, 1900, 55ff. (Geiger).(7) Forchhammer,*The Jardine Prize* (Rangoon 1885) 21, 104. (8) Cf. Weber, *Über Bahli, Bahlika* (Sitzungsber. 1892), (9) Cf. the literature to § 5, 8ff. (10) Trans. by Achundow in Kobert's Historical Studies 3, 137-481. To my *Identificirung von 21 indischen Drogen in Muwaffaq* printed there on pp. 294 ff. many additions can be made. e. g. red and white sandal=*Raktacandana, Candana.* (11) Cf.Royle (see below), German trans. by Wallach 81ff. (12) Cf. A. Webb, *The Historical Relations of Ancient Hindu with Greek Medicine* (Calcutta 1850, pp.34); Roth, ZDMG 26, 448; Haas, l. c. 659 ff; Weber, *Die Griechen in Indien* (Sitzungsber. 1890); Fasbender (§ 39) 62-70; Lietard, *La Doctrine humorale* (Janus II, 1897 ff.) (13) Hoernle, JASB, 69, 1. 2. 126 ff. (14) Cf. Thibaut, Grundr. III, 9, § 29, 46.

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(1849); Weber, Ind. Litt. (1st edn. 1852, 2nd edn. 1876, 283-90); Brisu, Coup d'oeil sur la medecine des anciens Indiens (Paris 1858, pp. 15); Lietard, Lettres historiques sur l' etat de la medecine chez les Indous (Paris 1863, pp. 76) Fragments d'histoire et de bibliographie. Gas. hebd. de medecine 1863 f. Resume de l'histoire de la medecine (Paris 1897, pp. 25-36) etc.; Daremberg, Recherches sur l' etat de la medecine. Un. med. (Paris 1867, S. A. pp. 24); Mrs. Manning, Ancient and Mediaeval India (London 1869, 1, 334-58); Haser, Lehrbuch der Geschichte der Medicin, 3rd Edn (Jena 1875, 4-38 with contributions by Stenzler); Hessler, Allgemeine Ubersicht der Heilkunde der alter Inder. Sitzungsber. math-phys. Cl (Munchen 1887, 1. 137-49) etc.; Von Schroder, Indiens Litteratur und Cultur (Leipzig 1887, 729-33), R. C. Dutt, History of Civilization in Ancient India (Calcutta 1890, 3, 382-95); Berendes, Die Pharmacie bei den alten Culturvolkern (Halle 1891, 1, 1-30); Jolly, Early Medical Literature of India, Transactions of the 9th Congress of Orientalists (London 1893, 454-61); Sir Bhagvat Sinhjee, A Short History of Aryan Medical Science (§ 1); Pagel, Geschichte der Medicin (Berlin 1898, 32-7), Macdonell, History of Sanskrit Literature (London 1900, 420 ff., 435 ff.); Cordier, Origines, evolution et decadence de la Med. Indienne, Annales d'Hygiene 1901. pp. 77-89.

2. Pharmacology :—Ainslie, Materia medica of Hindustan (Madras 1813, pp. 48, 301, 4, 2nd edn. London 1826); Roxburgh, Flora Indica (3 Vols. Calcutta 1832); Watson, Index to the names of Indian plants (London 1868, pp. 637 ff.) Waring, Pharmacopoeia of India (London 1868); Dutt, Materia Medica (§ 1); Garbe, Die indische Mineralien (Leipzig 1882, pp. 10,104); Dymock, Vegetable Materia medica of Western India (Bombay 1883 f.; 2nd edn. 1886, pp. 1012), Pharmacographia Indica (3 Vols, London 1889-93, pp. 599, 643, 641, 205); Watt, Dictionary of Indian Economic Products (6 Vols. in 9, London 1889-93, pp. 5236, Index 1896, contains also much historical information). Cf. also § 1. Further literature is added to the chapters concerned.

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II. Physicians and Therapy

§ 18. **Training of Physicians**[1] :— In the choice of a teacher the future physician should be cautious and should approach a person who is experienced both in theory and practice, is clever and blameless, has got control over his hand, has the necessary means and materials (of relief) and possesses friendly behaviour. Similarly a teacher should accept as a pupil only a young man from good family, especially from a family of physicians, intelligent, courageous and devoted to his teacher and one who has a good memory and other qualities. The beginning of instruction is preceded by a consecration ceremony (*Upanayana*). The instruction is not to be imparted on pretty numerous holidays and on unlucky natural events and occasions of impurity etc. He has to show particular respect and strict obedience to the teacher These and similar directions remind us of the statements of Dharmaśāstra about the conduct of the Brahmacārin[2] and are copied from them (Car. 3. 8. 1-5; Su. 1. 2; AS. 1. 2).

It is also not immaterial as to which text-book (*śāstra*) the pupil chooses, since many text-books are current among the physicians. Only such text-book is suited for study as is tested, recognised, easily understood, properly arranged and complete (Car 3. 8. 3). The study consists of learning by heart when the pupil reads the sūtras serially, utters them loudly and often repeats them (Car 3.8.6). It is, however, not sufficient simply to learn them by heart. The teacher should explain every word of the text and the pupil should repeat the explanations. Memory without knowledge would be useless, just like a donkey carrying sandalwood; it only feels the load, without being delighted by its fragrance (Su 1. 4. 3-4). Along with learning and teaching Caraka also speaks of discussions with specialists in different branches. They consist partly of peaceful conversations and partly of disputations, and advance the knowledge, insight, elocution and reputation. Suśruta stresses the necessity of practical training, for even a very learned physician would be incapable of practice without practical training. At the same time, on account of his surgical point of view, he emphasises methodical instruction in surgical operations. So one should demonstrate to the pupil the process of deep cuts, sections and cross-sections on various kinds of gourds and cucumbers, watermelons,

superficial parts of filled leather-bags, bladders (of animals) and pockets, the process of curetting on stretched and hairy animal-hides, the process of opening on the blood-vessels of dead animals, or a lotus -stalk, the process of probing on openings of a worm-eaten wood, bamboo, reed, objects like reed in general or dried large bottle-like gourds, the process of removing on the flesh of certain fruits or on the teeth of dead animals, the process of squeezing on a board smeared with wax, the process of suturing on the ends of two pieces of thick linen or soft leather, the process of bandaging on the limbs of a doll made of stuff or other material, the process of cauterizing and branding on tender flesh etc. (Su 1. 9).

(1) Cf. Roth, *Indische Medicin : Caraka*, ZDMG 26, 441-52; Puschmann, *Geschichte des medicinischen Unterrichts* (Leipzig 1889) 6-15. (2) Cf. Hillebrandt, Grundr. 3, 2, § 24-35.

§ 19. **Position and Practice of Physicians** :—After termination of his studies and his practical training, the future physician should secure permission of the king for the practice of medical profession (Su. 1. 10. 3). This permission of the king is necessary because otherwise the quacks would force their existence in his kingdom and might prove a public calamity (Ḍallaṇa). Caraka speaks very strongly of such cheats who wander about in the streets boasting in the garb of physicians. As soon as they hear of a patient, they hurry and praise loudly their medical capacities so that they reach his ears. They try to win over the friends of the patient by all sorts of attention and emphasize that they would be satisfied with small remunerations. When they treat a patient and are not able to allay his pains, they assert that the patient does not get the necessary remedies, he disobeys the directions given and that he cannot control his desire. When the case is hopeless they run away. They try to praise their cleverness before uneducated people, and by doing so they only betray their ignorance. They avoid the assemblies of educated people, just as a traveller avoids a dangerous forest. Nobody knows their teacher, pupil or fellow-pupil (Car. 1. 29. 9)[1]. Such quacks are particularly responsible for the bad reputation of physicians, as a result of which it was laid down in Dharmaśāstra not to accept charity from a physician (*cikitsaka*)[2]. Yet the Ambaṣṭhas whose business is healing art, hold a tolerably high position in the succession of castes, because paternally

they are descended from Brāhmans[2]. Even the modern Vaidyas in Bengal, of whom about one third practise medicine even to the present day, enjoy high regard. In the middle age the famous Sena dynasty descended from them[4]. The highest aim for a physician seems to be to treat a king and become the physician of the king. It was the duty of such court-physicians to protect the king from poisoning and to inspect the royal cooking for this purpose (cf. § 95). This also explains why Cakradatta, the famous medical author, was the son of the head-cook of a Bengali king[5]. In war also the physician should protect the king, particularly from poisoning, should purify the wells, food etc. poisoned by the enemy and should stay closely by the side of the king, treat poisonings, wounds and diseases occurring in his army (Su. 1.34). In fact Alexander the Great gathered the most expert Indian physicians in his pavilion in order to cure serpent-bites and also other ailments (Arrian, *Ind.* p. 15). Jīvaka Komārabhacca, a contemporary of Buddha, received very high honorarium for his wonderful cures[6]. A physician mentioned in the Ṛgveda desires to receive " horses, cattle and clothing " by means of his healing herbs[7]. The physician should give his medicines gratis to a Brāhman, a spiritual teacher, poor, friend, an ascetic and the like. On the contrary, he should not treat the hunters, fowlers, outcastes and sinners. By such procedure he obtains friends, fame, merit, wealth and satisfaction (Su 1. 2. 8). Regarding the outward appearance of the physician Su 1. 10. 3 says he should keep his nails and hair short, should bathe and wear a white dress, should wear an umbrella, a stick and shoes. He should be modestly dressed, of friendly speech, accompanied by a dependable servant and should thus go for practice. According to Car 1.8.18-28 he should direct his attention towards the curing of the patient and should not cause an injury to him even though his own life were at stake, should not think even once of the wife or property of anybody. He should avoid drunkenness, sin and bad company. He should not disclose events in the home of the patient, he should also not utter a word even if he felt the vicinity of death, lest it might do harm to the patient or to others. According to Su 1. 25. 44 the physician should treat the patient as his own son. On the hospitals see § 22.

(1) Cf. Roth, l.c. 452; Avinash Chandra Kaviratna's trans, pp. 408ff. (2) Manu 4. 212; Visnu 51. 10. (3) Manu 10. 8, 47 (4) Cf. Risley, *The tribes and castes of Bengal* (Calcutta 1892), 1. 47. (5) ZDMG 53, 379. Cf. § 4. (6) SBE 17, pp 173 ff.; Puschmann l. c. 14. (7) RV 10. 97.; Roth ZDMG 25. 646; Zimmer, *Altindisches Leben*, p. 398.

§ 20. **Diagnosis** :— The physician should go to the house of the patient at favourable signs, enter the house and observe, palpate and question him (Su. 1. 10. 4; AHr. 1. 1. 21). All five senses must be set to work at the medical examination. Thus in an abscess he should feel with the ear the bustling overflow of the air with frothy blood, the sounds in the entrails, the crack of the joint, changes in the voice etc.; with the eye the decrease and increase of body, colour, form and extent of the same, vitality etc.; with the taste the various tastes of urine in diabetes and other ailments, the bad taste in the body by the creeping of lice on the same, and the sweet taste by the creeping of ants etc.; with the touch, cold or heat, smoothness or roughness, softness or hardness and other qualities of skin in fever, jaundice and other diseases; with the smell, the smell coming out of the body especially at the approach of death. By questioning the patient one knows his native place (or home), his condition, caste, mode of living and diet, the origin of his disease, pains, vitality, appetite, the appearance or non-appearance of flatus, urine or stools, the duration of his disease etc. Much can be decided simply by inference (*anumāna*) (Su. 1. 10. 5 f.; Car 3.4).

Later works contain particulars of the medical examination. Thus according to Bhāv 1. 2. 162 f. the eyes are to be examined for their colour (red, yellow, white, brown etc.), further whether lustreless, sunken, watery etc., in order to know as to which of the three *doṣas* is affected. Similarly a rough and cracked tongue shows the derangement of wind (vāyu), a red or blackish the derangement of bile (pitta), a covered, moisty and white tongue shows the derangement of phlegm (kapha). The urine becomes whitish by vāyu, red and blue by pitta, only red by blood, white and frothy by kapha. The pulse-examination (*nāḍīparīkṣā*) is fully described. On this subject there exist special works under the title Nāḍīparīkṣā, Nāḍīprakāśa, Nāḍīvijñāna and the like. According to one[1] of these works, the pulse of left side in the case of women and that of right side in the case of men is to be examined, as a rule, only on the wrist; yet the pulse also in foot, neck and nose is at times examined. The physician feels the pulse by pressing the three middle fingers of his right hand. By vāyu the pulse goes like a serpent or a leech, by pitta it goes like a crow, quail or a frog, by kapha it goes like a swan, peacock, pigeons of different kinds or a cock. The condition is affected by the three Doṣas

and is incurable if the pulse is sometimes slow, sometimes weak and sometimes exciting, sometimes stopped, sometimes completely lost or scarcely felt, continuously abandons its natural place and then appears again. In diarrhoea the pulse is cool and slow. In cholera it is sometimes not traceable, sometimes it remains in its place. In disease of the worms (in intestines) the pulse is slow and weak, many times irregular or weak. In jaundice it is faint or excited as if it would spring out. In hemorrhage it is weak, stiff and soft. In consumption it shows the most varied movements. In internal wounds of the breast the pulse springs high and is quick, in consumption it is quite feeble, in cough it is shaky etc. Even at present the kavirāja in Bengal considers the pulse-examination as particularly important and capability to decide the nature of an ailment from the pulse is attributed to many physicians[2]. The pulse-feeling perhaps originated among the Arabians or Persians.

(1) *Nari-vijnana* or An Exposition of the pulse by Kaviraja Dhurmo Dass Sen Gupta, Calcutta 1893. (2) Risley, *The tribes and Castes of Bengal*, 1. 364.

§ 21. **Prognosis** :— More particular value is attached to the prognosis, for the clever physician should not treat an incurable patient. Therefore, in the description of diseases the unfavourable symptoms and signs of death are usually enumerated, and the bad omens as well as favourable signs are also discussed.

First of all is considered the messenger (*dūta*) who is sent for the physician, his appearance, caste, clothing, speech, as well as the appearance and behaviour of the physician when he is called. Thus it is unfavourable if the messenger belongs to a caste higher than that of the patient, if he is an eunuch, or a woman or is himself ill, sad, frightful, frightened, or comes running, or holds a weapon or a stick in hand, wears a garment which is worn out or torn or unclean or wet or wears only a single garment, if he is clean shaven or rides on an ass, camel or buffalo etc. Ominous is also the arriving of the messenger at a certain time, like midnight, midday, twilight, moon-eclipse etc., further if he meets on the way certain animals or birds or a corpse, a blind man or an enemy, if he had to face a hot and strong-smelling head-wind etc. The messenger must also not come to the physician when he is sleeping, lies undressed on the ground, is anointed, bears loose hair, perspires or offers sacrifice to Gods or fathers etc. It is, on the other hand, favourable if the messenger is white-clothed, clean, with

delightful appearance, is of the caste of the patient, sits in a cart pulled by oxen etc. (Su 1.29; AS 3.12; AHr 2.6)

The consideration of omens is extended also to the time of departure and arrival of the physician, and his reaching the patient. The dreams of the patient are also important. Thus one who dreams that he has drunk liquor in company with dead spirits and is attacked by a hound, will soon die of fever. It is also a bad omen if he dreams that a black woman with red clothes laughs at him and dances and binds him with torn hair, and moves to the southern direction, or that dead spirits and mendicants embrace him, or that he drinks honey or oil or falls in a swamp, or being naked, carries a red wreath on his head, or that he is devoured by a fish, or tumbles down from a mountain peak or is carried away by a current etc. (l. c.)

Other Ariṣṭas (bad omens) depend upon abnormal changes in the physical or mental condition of the patient. Thus if he feels to be hearing a noise or confounds various noises with each other, if he gets irritated at the voice of a friend and rejoices at the voice of an enemy, feels the cold as hot and hot as cold, feels burning heat in chilblain, does not feel a blow or even the cutting of a limb, believes to have seen stars and moon by day and the sun at night, if his eyes are remarkably restless or motionless, if brown, red, blue or yellow shadows follow him, if his teeth have become brown or have suddenly fallen out, if the tongue is white or brown, dry, heavy, benumbed, covered or rough, the mouth smells badly, the limbs become suddenly heavy or remarkably light, if the veins stand pre-eminent on the forehead not present previously, the sneezing, cough etc. sound differently from the usual, strong perspiration occurs without occasion, the patient does not have any sleep or sleeps continuously, his feet and hands are cold, the breathing is difficult etc. (Car 5.1.ff; Su. 1 30–32; AS 3.9.f.; AHr 3.5). The Ariṣṭas are not the same in all cases; they change according to the nature of disease. Thus the fever proves fatal if it is severe, deep-seated and continuous, is accompanied by delirium, giddiness, difficult breathing, swelling and indigestion, if the patient is strong but can speak only with difficulty, has red eyes and pain in the chest, is vexed by dry cough in the forenoon or afternoon, if he has lost his strength and flesh, and has phlegmatic cough (AS, AHr), further if he has become senseless and falls down unconscious, if he shivers with

cold while he feels hot within, rolls the eyes etc. (Su). Consumption is fatal if there is pain in the sides, constipation, vomiting of blood and pain in the shoulders. Diabetes is fatal if the usual complications are present,if the urine-secretion is excessive and dangerous ulcers are caused. Hemorrhoids lead to death if the hands, feet, navel, buttocks testicles and the mouth are swollen, there is pain in the chest, sides and limbs, the anus is inflamed, the secretion of blood is excessive and there is thirst, loss of appetite, colic and fever. The stone brings quick death if the testicles are swollen, the urine is retained and there is acute pain (Car 5.9; Su 1.33; AS 3.11; AHr 3.5). Further Ariṣṭas will be dealt with at the individual diseases.

Before commencing the treament (*karman, kriyā*) of a patient, the physician must find out his vitality which is known from certain signs on the body, such as large dimensions of hands, feet, sides,back, nipples, teeth, face, shoulders, forehead etc. He should treat such patients (Su 1.35).

§ 22. **Healing Substances** :— Physical ailments, says Caraka 1. 1. 58, are cured by medicine (*auṣadha*). Already in the Vedic medicine, the healing plants play a great role along with magic incantations. In the Bower MS very many medicaments, mostly vegetables, are mentioned. According to Viṣṇu 92. 17 it is meritorious to give free medicine. By the hospital for men and animals (*cikitsā, ārogya-śālā*) which are mentioned in Aśoka's inscriptions and Purāṇas and elsewhere, one understands by analogy to the modern *davākhānās*,institutions for distribution of medicinal remedies.

According to AS 1.12 medicines are of two kinds : (1) those giving strength and (2) those removing disease. The former are elixirs (rasāyana) and aphrodisiacs (vājīkaraṇa); the latter appease the disease or prevent its recurrence, and consist partly of mineral, vegetable and animal stuffs,partly of fastings,smearings, incantations and other procedures. According to Caraka, there are animal, vegetable and mineral medicinal stuffs.Of the animal stuffs he mentions honey, milk, excretas, fat, marrow, flesh, faeces, urine, skin, sperm, bones, sinews, horns, claws, hair and the gallstone of the cattle; of the minerals he mentions gold, the five metals (silver,copper, lead, zinc and iron), sand, lime, realgar, jewels, salt, red ochre and antimony. The plants are divided into four kinds : trees bearing fruit,

trees having blossom and bearing fruit, plants living for one year and creepers and bushes (*virudh*). Their roots, bark, solid interior, gum, stalk, juice, twigs, potash, milk, fruit, blossom, ash, oil, thorns, leaves, bud-covers, clods and shoots are used. Further Caraka specifies 16 plants among medicinal stuffs the roots of which are used, 19 the fruits of which are used, 3 the juice of which is used and 3 the bark of which is used; four kinds of fat (*sneha*) namely ghee, oil, fat and marrow; five kinds of salt namely *sauvarcala*–a blackish salt being the precipitate of a solution of the usual salt in a solution of rocksalt, *saindhava*– rock-salt from the Indus region, *Viḍa*– black salt, a decoction of usual salt with an addition of myrobalans and Soda[*], *sāmudra*– sea-salt, *audbhida*– desert salt; eight kinds of urine, namely of sheep, goat, cow, buffalo, elephant, camel, horse and ass; eight kinds of milk, namely of sheep, goat, cow, baffalo, camel, elephant, horse and woman.

According to Su 1.37 one must examine the ground while collecting the medicinal plants, whether it contains holes, pyrites, stones, anthills, desert-salt etc., whether it is soft, black, white or red etc. According to the condition the ground has the qualities of the five elements; thus one should take, e. g. purgative from the ground in which earth and water prevail, emetic from the ground in which fire, air and wind prevail. One should learn to know the medicinal plants from cowherds, ascetics, hunters and other people living in forests. One should take the animal substances like blood, hair, nails, milk, urine and faeces from grown up animals after their digestion. The hut (*bheṣajāgāra*)for preserving the plants should be erected on a clean place. Further (1. 38) he mentions over 700 plants divided into 37 Gaṇas according to the diseases for which they are to be applied, and gives them names according to the first plant of every group, as e. g. *arkādigaṇa* from Arka (*Calotropis gigantea*). This classification is crossed by another grouping (1.39) according to the effect of the medicine as emetic, purgative, errhine or pacifying remedy. Car 1.1-4 divides the remedies from similar points of view; particularly he mentions in 1.4 fifty groups of decoctions (*kaṣāya*) namely those which prolong life, make the body fat, make it thin, cause secretions, contract (the fractures), raise appetite, give strength, improve the complexion, cure hoarseness, stimulate the voice, remove oversaturation, hemorrhoids, skin-diseases, itch, maggots and poisoning, beget mother's milk or purify it, create or purify the sperm, are remedies for fattening,

perspiring, vomitting and purgation, remedy for ordinary and for oily enemeta, errhine remedy, remedy for retching, thirst, hiccup, diarrhoea, for change of colour of the faeces, for increasing the urine and for changing its colour, remedy for cough, asthma, tumour, fever, fatigue, feeling of heat or cold, nettle-rash, arthritis, colic, bleeding, pain, unconsciousness, barrenness and decrepitness. Each of these 50 groups covers 10 plants, so that 500 vegetable medicines are mentioned in them. The most exhaustive collections of medicines inclusive of the eatables and drinks with the exact information of their qualities and effects are contained in the medical glossaries. See § 11.

(1) Cf. Buhler, ZDMG 37, 98 ff.; Hemadri 1.894 ff., Puschmann l.c. 14 f. (2) Watt, *Economic Products of India*, 6, 2, 415.

§ 23. **Properties of Medicines** :— A number of general qualities and effects are attributed to the medicines as well as to the articles along with their specific effects in individual diseases. The six kinds of *rasa*– taste, are of special importance. They are : sweet, sour, salt, pungent, bitter and astringent. 1. The sweet causes stickiness in the mouth, increases the phlegm, chyle, blood, flesh etc., appeases thirst and hunger, delights and pleases, and causes many ailments like cough, asthma, flatulence, maggots, goiter, elephantiasis etc. when taken excessively. 2. The sour causes sensitiveness of the teeth, salivation and appetite, helps digestion, is mostly agreeable, but causes pus formation in wounds and ulcers and on account of the heat-producing nature of sour substances causes burning in throat, chest and heart if used in excess. 3. The salt purifies and stimulates digestion, but causes itch, tumour and other ailments if taken in excess. 4. The pungent provokes appetite and digestion, lessens the corpulence but its excessive use leads to nervous pain in hands and feet etc. 5. The bitter acts favourably on appetite and digestion, but causes convulsions, headache and the like by excessive use. 6. The astringent cures and purifies wounds, but causes convulsions cramps and the like by excessive use. All important medicines and articles of food are put by Su 1.42 in one of these six groups. In medical glossaries also the taste of every stuff is given.

When the stuffs come in contact with the digestion-fire in the stomach, they are changed by digestion (*vipāka*), whereby sweet and

salt things become sweet, sour things become more sour, and pungent, bitter and astringent things become pungent (AS 1.1; AHr 1.9). Many controversies still exist on this subject; the taste may indeed generally be considered as a product of digestion (Su 1.40).

Every medicine further possesses its own power (*vīrya*) : hot or cold. This is the usual doctrine, yet Su l. c. mentions a different theory according to which there are eight kinds of vīrya : hot, cold, oily or softening, dry or desicative, clear or purifying, slippery, mild and pungent.

All the stuffs have the properties (*guṇa*) of the elements of which they are composed. Thus the purgatives have prominently the properties of earth and water; they are, therefore, heavy and move downwards (Su 1.41).

§ 24. **Curing Methods :—** The most important curing methods are collected together under the name *pañcakarman*, namely vomiting (*vamana*), purgative (*virecana*), enemeta (*basti*), oily enemeta (*sneha*) and nasal therapy (*nasya*). The most usual vomiting remedy (*vamana*) is *Madana* (*Randia dumetorum*), a small sweet fruit like a small apple[1]. As a support to the action of vomiting, the patient puts a castor-stalk in his throat, while an attendant holds him by his head and sides. The physician must examine the vomit. Emetic is indicated in phlegmatic diseases,poisoning,fever,consumption, diseases of female breast, diarrhoea, diabetes, flatulence, cholera, indigestion, dyspepsia, nausea, erysipelas, leprosy, asthma, cough,elephantiasis, heart-disease, excessive fatness, madness, epilepsy, rheumatism,ozena, swollen tonsils and other diseases. Among the *virecanas* the foremost are *trivṛt* (*Ipomea Turpetum*), the most popular remedy of this kind among the Hindus even to the present day, and *eraṇḍa-taila* among the oils[2]. Purgative is prescribed in fever, poisoning, loss of appetite, hemorrhoids, swelling of the body and of the spleen, abscess, leprosy, fistula of the anus, female diseases,erysipelas, cholera, wind-dropsy, diabetes, strangury, wounds, burns, opthalmia, cataract or glaucoma, heat in the head and other parts of body, hemorrhage, jaundice, colic and other diseases (Car 1.15 f.; Su 4.33 f.; AS 1.27; AHr 1.18; Vr 73 f.). An enemeta is called *basti*, *bastikarman*. The enema-pot should be made of the bladder of cattle,buffalo, boar, goat or sheep or eventually

of leather or of thin but closely woven cloth; the tube (*netra*) should be made of gold, silver, copper, iron, brass, ivory, horn, reed etc., ending to a point like cow's tail, 12 fingers long for a patient of 25 years and thick as a thumb at the beginning. Bastis are prescribed in fever, diarrhoea, glaucoma, cataract, headache, opthalmia, convulsions, hemiplegia, flatulence, calculi (śarkarā), colic, swelling of testicles, constipation, strangury, stone, dystocia and many other diseases. They make an impotent potent, a thin man fat, a fat man thin, remove wrinkles and grey hair. Distinction is made between a cleaning enemeta (*nirūha, nairūhika*) and oily enemeta (*snaihika, anuvāsana*). Oily enemeta should be resorted to when the passages in the body are purified by nirūha. The recipes for enemeta are of many kinds. Accidents (*vyāpad*) in enemeta appear to have frequently occurred, since Suśruta counts 76 of them. In the first place he mentions wounds and pains in the anus. Injections in the urinary passages, also in vagina in the case of women,are called *uttarabasti* (Car 8.10-12; Su 4.35-38; AS 1.28; 5.4-6; AHr 1. 19, 5.4.f.; Vr 15 f.). Snuffs or nasal remedies (*nasya*) are then mentioned, whereby a medicine or an oil mixed with medicine is put into the nose (*nāsikā*, Su 4.40). Like enemeta, the Nasyas are divided into two classes, namely the purifying, purging the head (*śirovirecana*) and oily or strength-giving (*snehana, bṛṃhana*). Further the dropping of pungent juice is called *avapīḍa*, the introduction of powder in the nostrils through a reed is called *pradhamana*, the pulling up of oils in the nose by drops without swallowing them down is called *pratimarṣa*. The nose-remedies are suited particularly for diseases of head and throat (Su 4.40; AS 1.29; AHr 1.20; Vr 78).

In the application of *pañcakarman*, sneha and sveda precede and they play a great role. Among the animal fats, ghee is the best and among vegetable fats, sesame oil is the best. One can eat the fat or oil either unmixed or with various additions like salt, flesh-broth, flesh, milk, whey, pap and others, or turn them into embrocations, plasters, enemeta, eye-ointments, spraying in the nose and ears and the like. In internal use,the full dose (*uttamā mātrā*) is to be taken by strong patients with good digestion and in swelling of the body,serpent-bite, erysipelas, madness, strangury, constipation; the medium dose in tumour, small blister, itch, leprosy and other skin-diseases, and by those who eat moderately and who are not very strong and are not

constipated; small dose is to be taken by the aged or the children or by persons who are infirm or who have already taken a purgative or have weak digestion or are suffering for a long time from fever, diarrhoea or cough. Car 1.14 distinguishes 13 kinds of *sveda* : 1. *saṅkarasveda*, fomenting with objects like cowdung, sand etc. made hot in cloth and placing them on the suffering part of the body. 2. *prastarasveda*, sweating by a bed of straw on which the objects are put loosely in a cloth. 3. *nāḍīsveda*, the steam-bath through a reed, one end of which is applied to the body while the other sticks to the boiling pot. 4. *pariṣeka*, bathing with warmed medicinal stuffs. 5. *avagāha*, bath in a cask with warm water and medicines. 6. *jentākasveda*, sweating in a sweating room which is made hot through an oven with many holes. 7. *aśmaghanasveda*, sweating by lying on a hot stone. 8. *karṣūsveda*, filling a ditch beneath the bed of the patient with fire. 9. *kuṭīsveda*, sweating by lying on a bed in a compact hut. 10. *bhūsveda*, lying on level ground, in other respects like 7. 11. *kumbhīsveda*, burying a pot filled with medicines below the bed of the patient and adding heated iron balls or pieces of stone. 12. *kūpasveda*, filling a wide ditch with dung which is kindled and on which the bed of the patient is placed when there is no smoke. 13. *holākasveda*, the bed is placed on a heap of burnt dung.

Sveda is prescribed for rheum, cough, hiccup, asthma, pain in ears, throat and head, hoarseness, pain in the neck, apoplexy, constipation, urinary troubles and many other diseases (Car 1.13 f.; Su 4.31 f.; AS 1.25 f.; AHr 1.16 f.; Vr 71 f.)

By *dhūma* or *dhūmapāna*, fumigations in the nose or mouth are to be understood. According to Caraka the medicines to be used are powdered and kneaded into a ball which is fixed to the end of a reed-stalk. When the ball is dry, the stalk is pulled out, the tube thus formed is put in a pipe of metal, wood or ivory; it is then kindled and the other end of the reed is put into the nose or mouth. According to Susruta, there are five kinds of dhūma. AHr prescribes dhūma for headache and throatache and such other diseases; according to Car, Su, AS, it is prescribed also for sleeping sickness, exhaustion, green sickness, poisoning, bleeding, mania etc. (Car 1.5.24 f.; Su 4.40; AS 1.30; AHr 1.21; Vr 77). Local application of smoke through pipe in ulcers, skindiseases etc. is called *dhūpana*.

Fluids for *kavalagraha* and *gaṇḍūṣadhāraṇa* (mouth-rinsing and gargling) are prescribed particularly for the diseases of mouth and teeth. The fluid is to be retained in the mouth until tears come out of the eyes and drops begin to fall down from the nose; then a new portion of the fluid is to be taken (Su 4.40; AS 1.31; AHr 1.22; Vr 78).

For the ailments of the eye, instilling of drops (*āścyotana*) is prescribed in the first place, since it removes redness, lachrymation, pain, pus-formation and other affections of the eye. The eye-ointment (*añjana*), particularly made of Antimonium, is frequently spoken of, which is put into the eye with a probe (*śalākā*) (AS 1.32; AHr 1.23). Face-applications are called *mukhapralepa*, application is *pralepa* in general, softening poultice is called *pradeha*, suppository is called *varti*, *phalavarti*, ointment is *lepa*, *abhyaṅga*, *anulepana*[3]. Elixirs (*rasāyana*) form an important class of medicines to be taken internally. They are considered as the seventh subject of medicine; and it is said in many recipes that one could obtain a hundred years' life by their use. On Burns and Cauteries see § 29.

(1) Dutt, *Materia Medica* 177. (2) l. c. 202, 231. (3) cf. l. c. 17 ff.

§ 25. **Form and Quantity of Medicine :—** We can get an idea of the mixtures used by Indian physicians about 1600 years ago through the recipes that are prescribed in the Bower MS. Most of these consist of a considerable number of various ingredients and are adorned with sonorous titles like "Citron pills of Dioskuroi" (*aśvinīmātuluṅgaguṭikā*), the ambrosia of ghee (*amṛtaprāśam nāma ghṛtam*), ghee containing ten medicines (*daśāṅgam nāma ghṛtam*), an oil for removing wrinkles and grey hair (*valīpalitanāśanam tailam*) and the like. Many of these names as well as the recipes themselves are repeated in later medical literature.

In the preparation of medicines too, only a little change has occurred in course of centuries. Mention may be made here of some chief forms[1] all of which are found in the Bower MS : *Ghṛta*, medicinal stuffs are cooked with an addition of water, milk and the like; mostly for internal use. *Taila*, similar decoctions in oil; mostly for internal application. *Kaṣāya*, *kvātha*, decoction, particularly of 4 to 16 parts of water with one part of medicine; the mixture is boiled until one fourth remains.

Vaṭikā, *guṭikā*, pills and balls. *Modaka*,sweet uncooked pills. *Puṭapāka*, roasted vegetable medicines. The stuffs are turned into a ball which is enveloped in leaves, strung together and is covered with a layer of mud, whereupon the whole is roasted, then the shell is broken and the roasted medicine is given either as pill or powder, or its extract as juice with honey. *Cūrṇa*, powder, is pounded in a mortar and is strained through a piece of cloth. *Kalka*, paste of a plant bruised on a stone. *Svarasa*, natural juice which is produced in a mortar by pounding fresh plants. *Leha*, *lehya*, *avalehya*, licking substance consisting of thick extracts from plants with addition of sugar. *Yavāgū*, meal-sauce with an addition of medicinal stuff. *Ariṣṭa*, *āsava*, a fermented drink of honey, syrup and water with various medicinal stuffs. A variety of this is *cūrṇāriṣṭa*, which is mixed with a powder. *Kāñjika*, fermented rice-gruel. *Kāñjikaguḍa*, *kāñjikalavaṇa*, mixtures with syrup and salt respectively. As for the doses in which particular medicines are mixed and the mixtures are administered, much has been borrowed by the medical works from the recipes of the Bower MS. The apothecary weights correspond in general with those mentioned in Smṛtis. The most important small weight is *guñja*—the seed corn of *Abrus precatorius*, corresponding the modern *ratti* of the apothecaries and jewellers. However, there are wide local differences[1] regarding particulars. Children are to be given smaller doses.

(1) Cf. Dutt, *Mat. Med.* 9-16. (2) Bower MS p. 13, 78, notes;Colebrooke, Essays 2, 628 ff.;Buhler, remarks on Manu 8.134; Dutt, l.c. 7-9.151; Sachau, *Alberuni's India* 1.162 f.

§ 26. **Mercury and Opium** :— In order to go into the details of the application and history of particular medical substances a history of Indian botany, minerology, pharmacy and chemistry is required to be written,for which there is want of space here. Reference may be made to the rich material in Watt's *Economic Products of India*, Hoernle's Bower MS, Garbe's *Indische Mineralien* and other works quoted in § 17. In general, the use of minerals as medicines appears to have increased continually. The mercury (*pārada*) particularly attained the fame of a universal remedy which was used externally, especially for syphilis in later period, as well as internally. An entire class of literature was created on *rasa* (§ 3) in which other metals and minerals such as sulpher, gold etc. are also dealt with. Mercury is, therefore, called *rasendra*, *rasarāja*, *rasanātha*, the

king of metals. In *Rājanighaṇṭu* 33 different names are given to it[1]. Among the ascetics also the use of a mercury-preparation (*rasapāna*) for prolonging life was common, and even the philosophy developed (in 14th century A. D. at the latest) a mercury system (*raseśvara-darśana*)[2]. Mercury does not occur in the Bower MS; in Su, AS, AHr it is mentioned as Rasendra, Pārada only in a few places. Whether Caraka knew it, is doubtful[3]. At any rate the purification (*śodhana*) by heating and the consequent immersion in certain fluids and the " killing " (*māraṇa*) i. e. the calcination or powdering of mercury and other metallic processes which make it fit for pharmaceutical application, are not mentioned in these old works.

Watt[4] leaves the question open whether the Indians knew the medicinal effects of mercury before or after the Arabs. Since, however, the calcination of mercury is traced only to Mahommedan epoch, it may be believed that it originated from the Arabic alchemy in which mercury plays such a great role. The Indian physicians also received from the Arabians the opium which began to be cultivated in India since the 16th century A. D. and was formerly being imported from Arabia[5]. The designation of opium as *ahiphena* " Serpent-foam " is evidently only a popular etymological transformation of the old *aphena, afim, afin, afuka* and these expressions go back to one of the Arabic transformations (usually *afyun*) of the Greek ὄπιον and they come only in later works like Madanavinoda, Rājanighaṇṭu, Śārṅgadhara, Rasendrasārasaṅgraha and Yogaratnākara, while Caraka, Suśruta, AS, AHr do not know them. A constipating and norcotic effect (*grāhin, mohakṛt*) is attributed to it, wherefore it is particularly prescribed for diarrhoea[6] (Atisāra, Grahaṇī).

(1) Garbe, *Die indische Mineralien*, 60. (2) Cowell and Gough, *Sarvadarśanasaṅgraha*, 137-44. (3) Cf. ZDMG 54, 263, Dutt. *Materia Medica* XII, 22 ff. (4) *Economic Products of India*, 5, 234. (5) l. c. 6. 24. (6) Cf. Dutt, *Mat. Med.* III ff.

§ 27. **Surgical Operations**[1] :— The major surgery (*śalya*) deals with the extraction of foreign matters from the body (§ 81), the blunt and sharp instruments, cauteries and brandings and Vraṇa (wounds in the widest sense, see § 78). The surgery of the eye, ear, nose and throat (*śālākya*) covers all ailments of the head, and especially deals with eye-diseases (§ 82). Each of these two sciences

forms one of the eight subjects of medicine (Āyurveda) and Suśruta places it at the head of the same. He particularly points out the special importance of Salya (Su 1.1.3 ff.). The more important operations like laparatomy, stone, cataract etc. shall be described later on while dealing with the diseases concerned. Here, therefore, only certain general observations may be made.

The surgical operations are divided into eight parts : excision, incision, scarification, puncturing, probing, extraction, drainage and suturing. The surgeon must, therefore, keep ready the following : blunt and sharp instruments, cauteries and fire, probes (*śalākā*), a horn (for cupping), leech, a hollow calabash, probe for cauterization, cotton, cloth, thread, leaves, bandage, honey, ghee, fat, milk, oil, refreshing substances, boiled medicines, ointments, paste, fan, cold and hot water and pans. Sympathetic and strong assistants should also stand by his side. The operation should take place on a lucky constellation, accompanied by a religious ceremony and followed by a lengthy prayer by the surgeon. The patient who should have taken only a little food before the operation, is seated in front of the surgeon and is fast bound. In ulcers or wounds the instrument should be introduced with the precaution of avoiding dangerous places (*marman*), veins, bones and the like, until the pus is visible, and then should be quickly withdrawn. If necessary, counter-incision should be taken. The cut may be oblique, round or hemispherical according to the part of the body. The patient should not eat anything before the operation of dystocy, ascitis, hemorrhoids, fistula of the anus and mouth-diseases. After the operation the surgeon should refresh him with cold water, should drain out the wound with fingers on all sides, compress it, wash it out with medicines, cleanse it with cloth, should thereupon spread a layer of thick paste of sesame mixed with honey and butter, besmeared and soaked with medicines, upon which again another layer of paste comes, on it a compress, whereupon the whole should be tied fast with a piece of cloth. Fumigations and incantations then follow. After three days the bandage should be renewed. The healing process should not be precipitated so long as the pus is present. The patient must keep diet (Su 1.5). According to AS 1.38; AHr 1.29 the patient should be given to eat what he wishes and wine to drink before the operation, so that he may not faint and may not feel the knife.

Of the eight above-mentioned operations, the excision is prescribed in fistula of the anus, unripe growths caused by Kapha, dark moles, edges of the wounds, tumours, hemorrhoids and similar growths (*carmakīla*), foreign matters in the bones or in flesh, hairy moles, fleshy growths (in the palate), swollen tonsils, rotten ulcers on the penis (*śataponaka*), a red tumour on the palate (*adhruṣa*), abscesses on penis, flesh-tumour (in vagina ?), tumour on wisdom-tooth. Incisions are suited to deep going abscesses, growths, erysipelas, swelling of testicles, abscess on testicles or axillary cavity, carbuncles created by diabetes, tumour (*śopha*), diseases of the mammary glands, pustule on penis, cysts on eyelids, ulcers on the foot, fistula, throat-inflammation (*vṛnda* and *ekavṛnda*), the ulcer of the penis (*puṣpārikā* and *alajī*), most of the " minor diseases " (§ 67), tumours (*puppuṭa*) on palate and teeth, abscess on the tonsils, hard tumour in the throat and septic tumour or tumour originated from fat. The bladder is, on the contrary, to be opened only in stone. The four curable kinds of Rohiṇī (throat inflammation), leucoderma (*kilāsa*), a tumour on gums originated from fat, growths, abscesses, tumours on tongue, hemorrhoids, circular spots, growth of flesh and increase of flesh should be curetted. The different veins, hydrocele and dropsy are to be punctured and tapped. Fistula, wounds containing foreign matter and irregular wounds should be probed. The three kinds of sand, or gravel, tartar on the teeth, stone, foreign matter, dead foetus and the faeces accumulated in the anus should be extracted. Abscesses with the exception of the most difficult form, lepary skin-diseases (*mahākuṣṭha*), local swellings, abscesses on ear-lap, elephantiasis, blood-poisoning, tumours, erysipelas, teeth-tumours and many other swellings and skin pustules should be drained. Tumours originated from fat should be sutured after they are cut and cleansed; so also wounds and injuries on movable joints. The threads for suturing should consist of flax or hemp and other vegetable fibres or of sinew or hair of the tail of beasts. The needle should be 2 to 3 fingers long according to the part of body, and straight, round or three-edged or curved. The parts sutured together should be covered with cotton or linen; curing powder should be cast upon them and then they should be bandaged (Su 1.25).

On the 14 bandages in Suśruta see § 78. According to AS, AHr there are 15 kinds of bandages named after their form. On the buttocks (*bandha*), axillary cavity, sides, upper

part of thigh and on the head a tight bandage should be tied; on the arms and legs, face, ears, neck, penis, scrotum, back, sides, belly and the breast a medium tight bandage should be tied; on the eyes and on joints a loose bandage should be tied. Bandages should not be used in the case of lepary skin-diseases, wounds caused by burning, diabetic-carbuncles, wounds caused by cauterization or by poison and similar cases (AS 1.38; AHr 1.29, cf. Su 1.18).

(1) Cf. Trendelenburg, *De vet. Indorum chirurgia*. Berlin diss erta-tion, 1866. Haser, *Uebersicht der Geschichte der Chirurgie 3-5* (Breslau 1879).

§ 28. **Surgical Instruments** :—Descriptions of surgical instruments really agreeing in essentials are made only in Su (1.7 f.), AS (1.34), AHr (1.25 f.)[1]. Of the two kinds of instruments, namely the blunt (*yantra*) and the sharp ones (*śastra*), the former are divided into six kinds with 101 instruments in all. According to Su, the hand is the most important of all yantras, for without it no operation can be made[2]. The main function of the yantra is extraction of foreign matter (*śalya*) from the body, yet AS and AHr assert that yantras also serve to protect healthy limbs in difficult operations with knife, fire, cauteries, e. g. in diseases like hemorrhoids and fistula; they also assert that Basti, cupping horns, hollow calabash and other implements should be counted as yantras. 1. *Svastikayantra* " cross-shaped instrument " (pair of tongs) should, as a rule, be made of iron, 18 fingers long, the ends of the heads like beasts of prey and birds of prey, the arms of the pair held together by a pin the head of which is as big as a lentil and therefore bent where it is to be held. According to Suśruta there are 24 Svastikayantras, 9 appearing at the end like the heads of lion, tiger, wolf and other beasts of prey and 15 appearing like the heads of crow, heron, vulture, falken and other birds of prey. AS and AHr give no definite number. They serve to extract foreign matters from the bones, and really the 9 yantras bearing the heads of beasts of prey extract such foreign matters as are prominent and are easily siezable. The best pair of tongs applicable to all parts is that of heron's head. 2. *Saṁdaṁśa* (pair of tongs) of two kinds, with or without arms, 16 fingers long, to extract Śalya from the skin, flesh, veins or sinews. AS, AHr mention two more Saṁdaṁśas : (1) a smaller kind , 6 fingers long, to extract hair in the nose or on the eyelids, irregular flesh on the wounds and the like and (2) *mucuṇḍī* provided with a ring on the grip which serves to extract remnants of cut-off Pterygium or to remove irregular flesh in deep

abscesses. 3. *Tāla*, spoon, 12 fingers long, resembling the mouth of a big fish. There are two kinds : a single spoon and a double spoon. They serve to extract foreign matter from the ears, nose or fistula. 4. *Nāḍīyantra* " Reeds ", 20 kinds, with an aperture on one end or on both the ends, of different length and strength, according to the organ in which it is inserted, serving to extract foreign matters from the canals, (e. g. from the ear) for diagnosis (e. g. of diseases of throat), for sucking (e. g. poison), for the facilitation of operations (e. g. for washing out wounds) or for introducing medicinal stuffs. These reeds are applied in fistula of the anus, hemorrhoids, tumour,ulcer, enemeta, injection in the urinary passage, hydrocele, dropsy, inhalation, stricture of the urinary passage and the anus. The calabashes and horns for cupping also belong to this. AS and AHr describe some of these Nāḍīyantras in detail, thus a 10 fingers long and 5 fingers broad reed for the examination of a śalya stuck to the throat, a short but thick reed for examining, cauterizing and operating in the case of piles, a 16 fingers long reed for the examination of female genitals etc. 5. *Śalākāyantra* " instruments of the kind of awl " are 28 in number. Out of these, seven have earthworm-like points for probing, two have ends like an arrowshaft for shaking, two have ends like a serpent-hood for pushing, two have hooklike points for extracting, two have a little bent ends, of the form of a half lentil for extracting śalya from external organs, six have turbanlike points surrounded with cotton for wiping off (pus, blood, cauteries etc.), three have spoonlike points for introducing cauterizing material, three have heads like Jambu fruit for cauteries and brandings, one with a point like a half fruit-kernel for extracting or branding a tumour in the nose. There are three more Śalākāyantras for branding and one for introducing eye-ointment and for cleansing the urinary canal. AS and AHr mention a foetus-hook (*garbhaśaṅku*) for extracting a dead foetus, a hooklike instrument like serpent's hood for extracting stone in the bladder, an instrument with a point like an arrowshaft for extracting bad teeth, an ear-spoon etc. and six other instruments. The 25 *anuyantras* " secondary yantras ", i. e. helping implements are a magnet (for extracting foreign matter), a horse-bridle ring, branch of a tree (for similar purpose), thread, cloth-pieces and bandage, a hammer (for loosening foreign matter), cautery, fire and medicines, the hand and foot-palms,tongue, teeth, nails and the mouth, time, digestion. cheering and the like.

The knives or sharp instruments (*śastra*) which an expert smith should prepare from iron are divided, according to Suśruta, into 20 kinds : 1. *maṇḍalāgra*, with rounded point, according to Ḍallaṇa either round or formed like a razor, 6 fingers long and, according to Suśruta, applicable for scarification and excision in diseases of eyelids. 2. *karapattra*, saw, according to AS, AHr, 10 fingers long and 2 fingers broad, finely teethed, serving to cut the bone. According to Suśruta, 1 and 2 serve for excision and scarification. 3. *vṛddhipattra*, sharp or blunt, according as it is used for a superficial or deep tumour, serving for deep or superficial excision (AS, AHr). 4. *nakhaśastra*, with straight or crooked blade for extracting thorns and other small foreign matters and for cutting or cleaving the nails (AS, AHr). 5. *mudrikā*, ring, a small knife for operation of the throat (AS,AHr). 6. *utpalapattra*, resembling a blooming leaf of blue lotus. 7. *ardhadhāra*, one-edged or *adhyardhadhāra*, one and half-edged (AS, AHr). According to AS,AHr, 6th has a long and 7th has a short point; according to Suśruta, 3–7 serve for deep and superficial excisions. 8. *Sūcī*, needle, for sewing, of 3 kinds, according as it is used for fleshy parts, for bones, joints and the like or for the dangerous places in intestines or anus (AS, AHr). 9. *kuśapattra*, bearing the form of a Kuśa-blade, according to AS, AHr, two hands long. 10. *āṭīmukha*, " Āṭī-beak " i. e. formed like the beak of *Turdus ginginianus*, also two hands long (AS). 11. *Śarārīmukha*, " Heron-beak " according to Ḍallaṇa, a kind of scissors, according to AHr, a trocar. 12. *antarmukha* " with point in the middle", according to AS, AHr, sickle-shaped, 1½ fingers long, according to Suśruta (Hoernle) a pair of crooked scissors with straight part in the middle. 13. *trikūrcaka*, trocar. 8–13 serve, according to Suśruta, for cleansing abscesses. 14. *kuṭhārikā*, an axe with a ½ finger broad blade of the form of a cow-teeth. 15. *vrīhimukha*, " rice-corn-headed", the blade 1½ hands long, a pointed instrument for tapping fluid in dropsy, abscess and the like and for bleeding purposes (AS, AHr). 16. *ārā*, awl, four-cornered but furnished with a round point serving for boring through the ear-lap and for the examination of tumour (AS, AHr). 17. *vetasapattra*, i. e. cane-formed, edged and serving for boring through or puncturing (*vyadhana*), which,according to Suśruta, is the purpose of 14–17 in general. 18. *baḍiśa*, " Fish-hook ", with crooked point, for catching swollen tonsils, pterygium and the like (AS, AHr). 19. *dantaśaṅku* (*dantalekhana*) tooth-

picker, four-angled, serves for removing tartar. 20. *eṣaṇī*, " probe " of two kinds, viz. with earthwormlike point for probing of wounds or needlelike and furnished with a caustic thread for tearing fistula. In AS, AHr, there are 26 *sastras* among which, besides the above, there are a pair of scissors (*kartarī*) for cutting sinews, thread, hair and the like, an edged instrument (*śalākā*) of copper with a point like a grain of corn to prick the cataract, a reed-stick (*khaja*) with 8 points for effecting bleeding of the nose etc. According to Susruta most of the *śastras* are 6 fingers long. The edges should be so sharp that one could cut the hair on body. The vicarious instruments (*anuśastra*) are leech, cautery and fire, glass, rock-crystal, ruby, adular, cutting bark, hair, finger or fresh shoots for probing, the nail for extracting or cutting, and the like.

(1) Illustrations on the basis of Susruta's descriptions are found in Wise, *Commentary* p. 168, in the Su-editions of Abinash Chunder Kabiratna and Jib. Vidya. (3rd edn), in Sir Bhagavat Sinhjee's *History of Aryan Medical Science*, p. 182 etc. (2) Cf. P. Jivanram Vaidya, *Forceps used by the Ancients of India* (Bombay 1892).

§ 29. **Cauterisation and Branding** :— The cauteries (*kṣāra*) are the best and most important of all *sastras* and *anusastras*, because they are applicable in bad wounds or ulcers which cannot be treated by instruments; they provide for a substitute for the operations of deep and superficial cuts, intersections and scarification etc., cause branding, loosen, cleanse, appease the blood and cause cure, remove the derangement of tridosas,are advantageous particularly in excessive fatness, poisoning, haemorrhoids, skin-disease, bleeding and other diseases, and also can be taken internally[1]. External application is advised in skin-diseases of all kinds, haemorrhoids, fistula of the anus and other fistula, abscesses, mouth-diseases, throat-inflammation etc.; internally they are used in poisons of lingering effect, swelling of the body, derangement of digestion, loss of appetite, calculii, internal abscesses etc. *Kṣāra* is unsuitable in fever, diarrhoea, heart-disease, head-disease, eye-inflammation, pregnancy or menstruation, faint-heartedness, infirmity, childhood, oldage etc. It mostly consists of potash. Wood, leaves, roots and fruit of certain trees are burnt, the ash is collected and comparatively larger quantity (according to Susruta, 6 times) of water and urine of a cow or other animal is added, the

whole is sieved two times through a piece of cloth and is boiled for a long time in a big pan while it is stirred with a spoon. When the fluid becomes clear, red, sharp and phlegmatic, it is sieved through a big piece of cloth and is boiled once more along with an addition of boiled lime-stone and so forth. The application of cautery to the skin takes place with a probe (*śalākā*) around which cotton or piece of cloth (AS) is wrapped, while an assistant holds the patient fast. The skin is first to be rubbed and scarified. The cauterizing material should then be allowed to remain on the skin only so long as 100 words or syllables are uttered. The remedy should be considered as having had its effect if the skin has turned black. Sour substances with honey and ghee should then be applied on the place and other ointments should be used for expediting cure (Su. 1.11; AS 1.39; AHr 1.30).

Branding (*agni*, *agnikarman*) is still more efficacious than the cauteries in so far as it cures diseases which are not curable by medicines, instruments and cautery, and the diseases cured thereby do not recur. It is particularly prescribed in tumours, fistula, swelling of testicles, elephantiasis, swollen glands, decolourization of skin, bad wounds or ulcers, opthalmia,headache,haemorrhoids and other diseases. Branding can be effected not only with red-hot iron of various forms (*śalākā*, *sūcī*, *jāmbavauṣṭha*), but also with fluids like honey, syrup, oil or wax brought to boiling point with hot cowdung and other hot objects. The physician should brand the patient until the required effect consisting of bustling noise, bad smell and shrivelling up of the skin is attained. Honey and ghee and other ointments and plasters should afterwards be applied (Su. 1.12; AS 1.40; AHr 1.30).

(1) Even at present abscesses are rather treated with cauteries than opened with lancet. See Dutt, *Mat. Med.* 21.

§ 30. **Blood-letting** :— The mildest way of extracting blood (*śoṇitāvasecana*, *śoṇitamokṣaṇa*) is the application of leeches (*jalaukas*). They are, therefore, particularly suited to the Princes, rich people, children, old men, infirm, nervous and delicate persons and women. One should avoid the poisonous species the bite of which causes tumour, strong itch, fever, delirium and other bad symptoms, and should use only the 6 non-poisonous species. The leeches should be kept in a big new pot full of mud and water from a pond, and fresh

water and food should be given to them every three days and the pot should also be changed often. The skin-portion concerned should be rubbed dry with a powder of earth and dry cowdung and then leeches should be applied, after the body is smeared with mustard poultice (in order to irritate it) and is placed in water. If it does not bite, a drop of milk or blood should be put on the place or a small cut should be made. If the leech does not set itself free due to greediness, honey or powdered salt should be applied to its mouth. In order to make the leech fit for further use, it should be made to throw out the sucked blood. If the blood of the patient has still not become purified, the bitten places should be made to bleed by rubbing with honey and syrup. When (sufficient) blood has flowed out, the wound should be washed with cold water and should be covered with greased cotton. Astringent, sweet and cold pulp-poultices should then be applied. If the bad blood is removed, the tumour becomes soft, there is no burning, and redness and pain vanish (Su. 1.13; AS 1.35; AHr. 1.26).

Cupping of blood is similarly a mild form of treatment. A cow-horn is used for this purpose, at the pointed end of which a small piece of cloth is bound; or a hollow calabash is used in which a burning wick is placed. First of all, the skin is cut in many places (*pracchāna*), then the broad end of the horn is placed on it and the pointed end of the horn is sucked in order to rarefy the air, and then it is covered with cloth. In the case of calabash, the rarefying of air takes place before applying the burning wick (Su.1.13; AHr l.c.). Mention is also made of mere scarification (*lekhana*, *pracchāna*) without the use of sucking instrument, with regard to the diseases to be cured thereby. See § 27.

Both the scarification and blood-letting (*sirāvyadha*) are effected with sharp instruments and are, therefore, more severe forms of blood-letting. Bad blood causes abscess, swelling of the spleen, fever, diseases of mouth, eye and head and many other diseases; therefore, one should open the veins for letting out the superfluous blood. Blood-letting is unsuitable for those who have undergone one of the five curing remedies (cf. § 24) or have taken oily substance, have no bad blood, are below 16 years or above 70 years, women who are carrying or are

lying in and also for people suffering from asthma and cough, diarrhoea, vomiting, anaemia, oedema all over the body, apoplexy, hemiplegia etc. The lancets *kuṭhārikā* and *vrīhimukha* are mentioned as the instruments used in blood-letting. cf. § 28. Before the operation the patient should be anointed, sauce of meat of wild animals and rice should be given to him to eat and he should be asked to get seated in a soft seat. A servant should put a piece of cloth around his neck from the back side and hold him fast with it, without causing choking. It depends on the place of the ailment as to which veins the surgeon has to open. Thus in the case of ailment of head and eye, veins on the forehead or on the nose and on external eye-angle, in ear-diseases the veins on the ear, in nasal diseases a vein on the point of the nose, in madness a vein in the chest, on external eye-angle and on the forehead, in deep-seated abscesses those in the sides and between the arm-pit and nipple should be opened. The lancet is to be inserted quickly, neither too deep nor too superficial, in the middle of the vein without striking a dangerous place (*marman*). If the blood does not flow in required quantity, the wound-place should be rubbed with a paste of lampblack, salt and oil mixed with powdered *tagara* (*tabernaemontana coronaria*) whereupon the blood flows properly. When it has flowed enough, the place should be moistened with lukewarm oil and salt. If the patient faints, he should be brought to senses by cold water and fanning, and the blood-letting should be continued further; in the case of repeated faints it should be resumed one or two days later. The maximum of tapping blood amounts to 1 *prastha* (= 16 *pala* or handfuls). After the operation an oily cloth should be laid on the place and tied (AS,AHr). According to Suśruta, cold should first be applied for blood-stopping, whereby the blood becomes thick and then astringent decoction or ash should be applied for drying the wound,and in worst cases hot iron should be used. Besides, he mentions various powders for rubbing in the case of excessive blood-flow (Su. 1.14; 3.8; AS 1.36; AHr 1.27).

§ 31. **Diet :—** In the Bower MS. 1.51 the principle is laid down that the sensible physician should first of all take into consideration the regulation of digestion always and in all diseases and then turn to the curing of the disease. According to Car 1.25.31 proper nourishment is the only way to make the patient strong; injurious

food is the cause of ailment. Therefore, nourishing methods and substances serving that purpose (*bṛṁhaṇa, tarpaṇa*), as well as the fasting methods and the remedies for becoming thin (*laṅghana, apatarpaṇa*) play an important role. But actually all kinds of food, solid or liquid, are enumerated in groups with information of their medicinal properties and effects, their taste and natural temperature (warm or cold). Eating flesh is not principally forbidden as in religious literature, but in conformity with the viewpoint of Smṛtis and Aśoka's inscriptions (*Recht und Sitte*, § 59) only the use of deer and of the sauce of deer (*jāṅgalarasa*) is recommended. Of the birds, those of the *viṣkira* kind (scrapers), viz. quails, francoline, sparrows, peacocks, wild hens, partridges and the like should be eaten; of fishes, the *rohita* (*Cyprinus Rohita*). The flesh of the animals of marshy place (*ānūpa*), chiefly of buffalo, is also frequently recommended. On the contrary, one should not eat the flesh of pigs, cattle,most of the fishes,at least not regularly (*na śīlayet*, Car 1.5.8.). The medical works also do not take a declining view of the use of spirituous drinks (*madya*) which appears in the Smṛtis as a sin punishable by death, and warn only against overdose or excess (cf. § 92). According to Suśruta, all madyas are sour in taste, excite appetite and digestion, increase pitta and lessen kapha and vāta, purge and purify the bladder, give an exhilerating effect etc. Fermented drinks from grapes, date, syrup, rice, barley and other plant-stuffs are distinguished and particular effects are attributed to each of them.For the liquors counted among medicinal stuffs, see § 25; for the application of liquor for norcotic in operations, see § 27. The most important articles of food are the various corns, particularly rice, of which a great many varieties are mentioned. The most important are the winter-rice (*śāli*), particularly the red rice (*raktaśāli*) to which is attributed an effect of curing the disease, the " 60 days rice " (*ṣāṣṭika*) which becomes ripe in summer in low contries and *vrīhi*, the rice of rainy season. Besides the rice, barley, wheat, beans, peas, lentils, millet and other corns are mentioned. Suśruta denotes the smaller variety as inferior corn (*kudhānya*). Further groups (*varga*) are formed by fruit, vegetables, turnip-rooted fruit, herbs (ginger, garlic which is already celebrated in the Bower MS, etc.), salt, prepared food (rice-sauce, cooked rice, roasted rice, slime, cake, sour food etc.), liquids like water, milk, oil, molasses, buttermilk, ghee, honey, urine (in medicine), the above-mentioned liquor etc. The

best water is rainwater which should be collected in autumn and should be used throughout the year. On the other hand, unhealthy water is that which is infected by leaves or mud, has bad smell or bad taste. The sugarcane is also eaten raw, but especially medical effects are attributed to its pressed juice, boiled or unboiled, to the syrup and the sugar. Of the oils, sesame oil is especially much used as an article of food as well as a medicine (external and internal). For salt, milk and urine, see § 22. Drink after repast (*anupāna*) is also sufficiently discussed. Thus according to Caraka, milk as anupāna works like ambrosia in exhaustion by fasting, walking, speaking etc. Thin people should take liquor after meal to become fat and fat people should take honey and water to become thin. Then are enumerated *viruddha* foods and drinks, i. e. those not suited to one-another and therefore causing unfavourable effect if combined, e. g. fish with milk. As usual food Car 1.5.9 recommends rice (*ṣaṣṭika* and *śāli*), *mudga* (*phaseolus mungo*), rocksalt, myrobalans, barley, rainwater, butter, venison and honey (Car 1.27; Su 1.20; 1.45 f.; AS 1.6 f.; 1.9 f.; AHr 1.5. f; Bhāv 1.1 227 ff; Rājani.). The quantity of food should be adjusted according to the digestive capacity (Car 1.5 etc.). There are only two daily meals : in the morning and in the evening.

§ 32. **Hygienic Directions :—** The day-to-day duties (*dinacaryā*) are both a matter of religion as well as of medicine. The statements in the medical works, therefore, often agree[1] literally with the statements in the Smṛtis and Gṛhya sūtras. Getting up before sunrise, the first duty consists of answering nature's call, at which the head is covered. The cleansing is done with water and earth. Then follows the cleansing of teeth with fresh tooth-stick which should be taken from a certain tree possessing astringent, sharp or bitter taste. Precaution must be taken not to hurt the gums. According to Caraka, the teeth should be brushed two times a day. The tongue should then likewise be scraped with a tongue-scraper (*jihvānirlekhana*). The mouth should be rinsed with cold water and the face should be washed. The eyes are to be treated every day with an ointment (*sauvīrāñjana*—antimony sulphide)[2] which is applied to the inner surface of the eye-lids. Thereby the eyes become beautiful and keen. Besides, every 5 or 8 days (Car) or 7 days (AS, AHr) an ointment *rasāñjana*—an extract from *Berberis asiatica* with milk should be used in order to make the eyes shed tears and thereby to relieve them of kapha and to improve

the sight. The whole body should be anointed with fragrant oil to remove the bad smell, heaviness and fatigue in the limbs and itch, loss of appetite etc. Daily anointing of head with oil obstructs the falling or gray hair, allays headache and promotes sleep. Oiling the ears protects one from ear-diseases, stiffness of throat, lockjaw, difficulty in hearing and deafness. Anointing the feet removes roughness, dryness, heat, fatigue, numbness of feet, sciatic pain, fissures of the feet etc. Betel-leaves, camphor, cardamom and other spices should be chewed in mouth in order to promote cleanliness and fragrance of the mouth and appetite. Movement or physical exercise (*vyāyāma*) gives activity, strength, good digestion and reduction of fat. Yet it should be avoided in diseases of vāta and pitta, indigestion and the like. Rubbing or massaging the body (*udvartana*) removes kapha and fat, makes the limbs strong and the skin tight. Bath makes the body clean, promotes appetite, potency and vitality, gives freshness and strength and removes itch, weariness, perspiration, thirst, heat etc. Warm baths or washes are advantageous only to the lower half of the body, but injurious to the upper. Baths are generally harmful in flatulence, rheumatism, indigestion and after meal. To use fragrance and garland, to wear fresh clothes, jewels and ornments gives potency, good smell, vitality, favouriteness etc. It is likewise advisable to wear shoes, umbrella and a stick. Care of hair, beard and nails is also recommended according to Bhāv 1.1.93, which also advises to use a looking glass. One must get oneself shaved every five days. Natural tendencies like stool, urine, sneezing, sleep, phlegm and the like should not be suppressed, nor they be artificially excited. One should not sleep by day except in summer, should not see the rising or setting sun etc. (Car 1. 5; 1.4; AS 1.3; 1.5; 1.8; AHr 1.2; 1.4; Bhāv 1.1.89 ff.; Vṛ 81).

The modifications which the dietetic regulations undergo according to the change of season, are called *ṛtucaryā*. Side by side with the common year, there is, according to Suśruta, a medical year which, like the former, has six seasons (*ṛtu*), but begins on the 15th February. *Śiśira*, the first season of the common year, is left out, but *prāvṛṣ*, earlier rainy season from 15th June to 15th August, is introduced as a third season. However, time is reckoned usually according to the common year. According to Caraka, one should eat in *hemanta* (15th November to 15 January) fat, sour and salt sauce of flesh of watery and marshy animals and goats and iguana roasted on the spear

and the like and beasts and birds of prey (*prasaha*), because the cold increases the digestive power and enables the digestion of heavy and rich food. He should also take liquor, milk-preparations, sweets, fat, oil, new rice and hot water. Caraka also recommends the use of ointment, massage, anointing the head with oil, residence in hot chamber, in the sun or in a warm underground place or inner room, under the roof of a carriage, in bed and seat with warm cover, warm clothes and smearing the body with a thick paste of aloes wood (*aguru*) as well as sleeping with a fully developed woman. Similar rules are given for *śiśira* (15th January to 15th March); only one should look for a still better and warmer room protected from the wind, and avoid pungent, light, cold and similar food and drink. In both these cold seasons man is at his best strength. In *vasanta* (15th March to 15th May) the accumulated kapha provokes many diseases; therefore, emetics etc. should be taken and heavy, sour, oily and sweet food as well as sleep by day should be avoided. Exercise, massage, inhalations, water-gargling, ointment, washing and bath in cold water are likewise recommended. As for food and drink, barley and wheat and the flesh of stag, hare, antelope, quail and francoline, and certain kinds of liquor are recommended. In summer (*grīṣma*–15th May to 15th July) one should eat tasteful, cold, fluid and oily things, cold preparation of barley with milk and sugar, deer, ghee, milk and rice. Spirituous drinks should be taken only in small quantity or not at all or largely mixed with water. Salt, sour, pungent and hot things, as well as physical exercise and cohabitation and sleeping by day in a cool place should be avoided. At night one should sleep in a place which has become cool by rays of the moon, particularly on the windy roof of the house, should anoint oneself with cooling sandal-ointment, get oneself fanned with a cool fan, live in cool forests etc. In the rainy season (*varṣāh*–15th July to 15th Sept.) the digestive system is weakened; therefore, one should keep diet, should avoid eating of *udamantha*, sleeping by day, physical exercise, cohabitation, sunheat etc., should eat barley, wheat and old rice with deer and boiled sauce, medicinal liquor in small dose with honey or water which is collected from rain or is previously boiled etc. Massage, baths, residence in dry place etc. are also advised. In summer and in rainy season man is the weakest. In autumn (*śarad*–15th Sept. to 15th Nov.) one should eat in moderate quantity things which are sweet, light, cold, bitter and which

lessen pitta, as well as deer, rice, barley and wheat; should use pure water of a spring for washing, drinking, bathing, avoid bitter drink, ghee, purgative, blood-letting, fat and oil, eastern wind etc. (Car 1.6; Su. 1.6; 6.64; AS 1.4; AHr 1.3; Vr. 81; Bhāv. 1.1.121ff.).

The division of land is threefold according to climatic conditions : *ānūpa*–moist, swampy, *jāṅgala*–dry and *sādhāraṇa*–neither dry nor moist. According to Suśruta *ānūpa* is a watery land with ups and downs, rivers, plenty of rain, thick forest, mild and cooling winds and many high mountains and trees; its inhabitants have a soft, tender and fleshy body, and suffer particularly from diseases of kapha and vāta. *Jāṅgala* is an even land with detached and small thorny trees or bushes, and little rainfall; it draws its water chiefly from walls,has hot and bad winds and has detached and scanty hills; its inhabitants have a strong but thin body and suffer from diseases of vāta and pitta. According to the law-books, the king should reside in such a place. The commentators of law-books define *jāṅgala* as the land which has little water and grass, is windy and sunny, rich in corn and the like. *Sādhāraṇa* is the land with a combination of both these qualities where cold, rain, heat and wind are proportionate and the three basic principles (tridoṣas) are held in balance. The diseases of both the other climates (e. g. elephantiasis of the swampy land-Ḍallaṇa) are not so predominant there. The change from one climate into another is unhealthful except when the conditions of the new climate are adjusted by the diet, sleep, work etc. (Su. 1.35;AS 1.1;AHr 1.1;Bhāv 1.1.87 f The parallel passage in Car 3.3 in some editions is not genuine).

(1) Viṣṇu 60 ff., Manu 4.35 ff., Cf. '*Early Medical literature of India* by J. Jolly, Transact. 9th Orient. Congress, p. 459. (2) Dutt, *Mat. Med.*, 73 f. (3) l. c. 107. (4) Cf. Hoernle, Su. 35 ff.

III. Theoretical Conceptions

§ 33. **The Tridosas :—** The principle of three *doṣas* (*dhātus*) of human body goes like a red thread through the whole of medicine. The three *doṣas* are : wind (*vāyu*, *vāta*, *māruta*, *anila*, *samīraṇa*), bile (*pitta*) and phlegm (*śleṣman*, *kapha*). The disease or being ill is defined as the derangement of the dosas and health as their normal condition or balance (AHr 1.1.20). Without *kapha*, *pitta* and *vāta* as well as blood the body cannot exist,they always sustain it (Su. 1.21.3). The usual name *doṣa* "defect" shows that dosas deranged or existing in excess are to be properly treated. The name *dhātu* characterises them as the elements of the body. *Vāta* is dry, cold, light, delicate, moving, clear and raw, *pitta* is greasy, hot, sharp, fluid and acrid, *kapha* is heavy, cold, mild, oily, sweet, stable and phlegmatic. By substances (medicines and articles of food) of opposite qualities they are neutralised and cured (Car 1.1.61). *Vāta* prevails in advanced age, *pitta* prevails in the middle age and *kapha* prevails in childhood. Similar condition concerning the prevalance of the dosas exists also with regard to the end, middle and beginning respectively of the day, the night and the digestion (AS 1.1; AHr 1.1.8). The dosas pervade and occupy the whole body, yet *vāta* has its chief place below the navel, *pitta* between the heart and navel, and *kapha* above the heart (l. c.). *Vāta* is divided into five kinds : 1. *udāna*, in throat, goes upwards and causes the speech, music etc., and by its derangement those diseases particularly occur which have their place above the collar-bone (in throat and head). 2. *prāṇa*, in heart, causes breath coming from the mouth that leads the food inside, and causes inward breath; by its derangement hiccup, asthma and similar diseases occur. 3. *samāna*, in stomach and intestines, digests the food by the digestive fire and analyses it into its elements (chyle, excreta, urine etc.); if deranged it causes weakness of digestion, diarrhoea and swelling of the body. 4. *apāna*, in lower body, drives the faeces, urine, sperm, menses and the foetus below and if deranged causes the dangerous diseases of the bladder, anus, sperm as well as diabetes. 5. *vyāna*, in the whole body, causes the division of fluids, the flow of sweat and blood, and the moving, opening and closing of the eyes etc. According to AS, AHr, Bhāv, the bodily functions of movement, filling with food, retention of secretions etc. rest on *vyāna*, while according to

Suśruta (Ḍallaṇa) these functions are distributed among the five kinds of vāyu. The diseases catching hold of the whole body are caused by the derangement of *vyāna*. By simultaneous derangement of the five *vāyus*, man is no more (Bhāv.). There are five kinds of *pitta* : 1. *pācaka*, *paktikṛt*, between the stomach and intestines, causes the digestion and secretion of chyle,urine and excreta. 2. *rañjaka*, *rāgakṛt*, in the liver and spleen or in stomach, colours the chyle and turns it into blood. 3. *sādhaka*, in heart, causes sight, determination and memory. 4. *ālocaka*, in the eyes, causes faculty of seeing. 5. *bhrājaka*, in the skin, gives glaze to skin and absorbs ointment. There are five kinds of *śleṣman* : 1. *kledaka*, in stomach, moistens the food and the other places of phlegm in the body. 2. *avalambaka*, in the heart, causes firmness of limbs. 3. *rasana*, *bodhaka*, in tongue, brings about the taste. 4. *snehana*, *tarpaka*, in head, oils and refreshes all sense-organs. 5. *śleṣaṇa*, in the joints, makes the joints flexible (AS 1.20; AHr 1.12; Bhāv 1.1.28 ff; Su. 1.15). By certain signs one can know as to which of the three dosas prevails in the body. Thus men with predominance of vāta are inclined to waking, are voracious, atheists, addicted to music, joke, hunting and fight, having lust for sweet, sour, sharp and hot food and drink, very talkative, unstable, thievish, disaffectionate,not having many children, thin, tall, having weak, stagnant, trembling or rough voice, miserable etc. Men with predominance of bile are bold, proud,civilized, clean, intelligent, prudent, not loved by women and not of loving nature; they eat sweet, astringent, sharp and cold things; dream of lightning, fire and the like; are tended to perspiration, bad smelling,have brown hair (on the head) and little hair on the body, become prematurely grey etc. Men with predominance of kapha are intelligent, trustworthy, faithful, truthful, do not utter any disgrace, are patient, grateful, eat pungent, astringent, hot and dry things but only in small quantity, dream of ponds covered with blooming lotuses and clouds, have many sperms and many sons and servants, long arms, a full and broad breast, high forehead, thick and dark hair etc. (Su. 3.4; AS 2.8; AHr 2.3). Increase or decrease of normal *doṣas* evokes ailing appearances (Su. 1.15). It depends particularly on diet; thus sour food increases pitta, sweet food kapha and pungent food the vāta (Car 1.27.3).

According to another opinion which already comes in the Bower MS, blood is also a *doṣa* and so there are four *doṣas*. The blood

is also often considered as exciter of disease[1].This conception is importtant, because it reminds us of the Greek humoral pathology. On the other hand, *vātīkāra*, *vātīkṛta*[2] comes already in the Atharvaveda, *vātagulmin* in Viṣṇu 46.27; so that at least the vāta belongs to the Vedic medicine. If the rite described e.g. in Kauśika sūtra 26.1 is considered as directed against vāta, pitta and kapha as informed by the commentator, the old tradition may be proved to be still earlier. The old Buddhistic medicine also knows the three doṣas. Cf. §§ 14-16.

(1) Cf. Hoernle, *Bower MS*, 1.93; ZDMG 53, 379. (2) Cf. Bloomfield, SBE 42, 246, 483, 516 ff

§ 34. **The Seven Basic Elements** ;— The blood belongs to the seven basic elements (*dhātu*) of human body : *rasa*–chyle, *rakta*–blood, *māṁsa*–flesh, *medas*–fat, *asthi*–bone, *majjā*–marrow, *śukra*–sperm.

1. *rasa*— Juice, chyle, has its place in heart and originates from properly digested food as a transparent extract of extreme fineness. From the heart it flows through the 24 tubes (*dhamanīs*), 10 going upwards, 10 going downwards and 4 horizontal; feeds day by day the whole body, makes grow, maintains, supports and animates it by an invisible power. At the end of five days *rasa* is transferred into *rakta* and then successively into the other basic elements of the body and thus requires a month in order to become sperm or, in the case of women, ovum (Su. 1.14). *Rasa* gives good mood and feeds the blood. Burnt on account of the weakness of digestion, it becomes pungent or sour and provokes many diseases (Bhāv 1.1.37). 2. *rakta*—red fluid, blood, originates from *rasa* when the same reaches the liver and spleen and there becomes red by the heating effect of pitta. Normal blood is red like the Coccinelle, not thick nor faded (Su. 1.14). Its colour is also compared with that of ruby, lac-dye, Gunjā-seed and refined gold (Car 1.24). The inference from certain expressions particularly in Bhāv that blood-circulation was known to Indians already before Harvey[1] (1619 A. D.) seems very doubtful. Spoiled by the doṣas individually, by pair or collectively, blood becomes frothy, black,blue, yellow, green, flowing slow or fast, not desired by ants and flies, oily, thick or thin, bad smelling etc.One must then proceed for blood-letting. From spoilt blood various diseases are caused, e.g. inflammation in the mouth, nose and eyes, swelling of the body, erysipelas, abscess,

haematuria, nettlerash, dysmenorrhea, madness, leprosy, indigestion, irritability etc. (Car. Su. l.c.). 3. *māṁsa*—flesh is blood digested by the natural fire which is condensed by the wind. Muscles—*peśī*, are a part of flesh (Bhāv 1.1.38). 4. *medas*—fat is flesh digested by the natural fire and has its chief place in the belly, wherefore in fatty people the belly is protruding (l.c.40). 5. *asthi*—bones are fat digested by the natural fire and dried by the wind. They form the kernel of the body and remain after the decay of the skin and flesh and sustain still longer (l.c.). For particulars see § 35. 6. *majjā*—marrow is a tough juice of bones digested by the natural fire which separates like perspiration (l.c. 42). 7. *śukra*—the generative element originates from marrow and has its chief place nearby the bladder and is also present all over the body.

By decrease and increase of the basic elements of the body deteriorating changes occur in the same. Thus there occur heart-disease, trembling, a feeling of emptiness and thirst by the decrease of *rasa*, and nausea and salivation by increase of the same. By decrease of *śukra* there is pain in the penis and testicles, impotency or slowness in the emmision of sperm and blood is mixed with the sperm. Sperm-stone and excessive sperm-effusion are caused by its over-abundance (Su. 1.15).

The quintessence of all the seven elements is called *ojas*—vitality or *bala*—power and as a result of the same external and internal organs fulfil their functions. *Ojas* is oily, white, cold, soft etc. and pervades the whole body. It is demolished by injuries,grief, exhaustion, hunger and the like. There are three grades of the derangement of *ojas*; the worst stage leads to death. (Su. 1.15).

(1) Sir Bhagawat Sinhjee, *Aryan Medical Science*,pp. 93 ff. Hoernle (Su. p. 89) considers the substitution of the variant *anudhavato* " running through" for older *anusarato* "going through" (Su. 1.14.1) as a result of the knowledge of blood-circulation in India. However, it cannot be said that Indian authors meant thereby the recurrent movement of blood.

§ 35. **Anatomy** :— The outlines of anatomy of human body apparently formed a *locus communis* of Sanskrit literature[1]. Thus the osteology in Caraka on one side and the law-books of Viṣṇu (96,55 ff.) and Yājñavalkya (3.84 ff.) on the other side is nearly identical, as the following survey shows :—

Name or place of Bones	*Number of Bones* Caraka 4.7	Visnu, Yājñavalkya.
Teeth	32	32
Roots of teeth	32	32
Nails	20	20
Hands and feet	20	20
Fingers and toes	60	60
Heels	2	2
In the lower part of the palm	2	
Hand-joints	4 (v.1.2)	
Foot-ankle	4	4
Elbow	4	4
Lower part of the thigh	4	4
Knee	2	2
Bend of the knee (Pelvis ?)	2	2
Upper part of the thigh	2	2
Arms and shoulders	2	2
In the lower part of the temple	2	2
Palate	2	2
Hips	2	2
Pubic-bone	1	1
Upper Coccyx	1	
Lower Coccyx	1	
Back	35 (v. 1.45)	45
Neck	15	15
Clavicle	2	2
Chin	1	1
Lower jaw-bone	2	2
Forehead	2	2
Eyes	2	2
Cheeks	2	2
Cartilage of the nose		1
Nasal bones	3	
Ribs and spine	72	72
Temples	2	2
Head	4	4
Breast	17	17
	360	360

AS 2.5, AHr 2.3 also distinguish 360 bones. In Su. 3.5 there are 300 only, yet the figure 360 was known to him. The whole body is further divided into six chief parts (*aṅga*) : arms, legs, trunk and head. As sub-sections (*pratyaṅga*) are mentioned cranium, belly, back, navel, forehead, nose, ears, eyes, fingers and others. According to Caraka they are 56. There are 6 (or 7) skin-layers in which originate the various diseases like erysipelas, tumours, abscesses, leprosy etc. that go more or less deep. The five sense-organs, viz. the skin, tongue, nose, eyes and the ears correspond to the five sense-functions : feeling, taste, smell, sight and hearing. Besides there are five active organs : hands, feet, anus, genital and the tongue. There are 7 reservoirs (*āśaya*, *ādhāra*) or hollow entrails in which air, bile, phlegm, blood, undigested food, digested food and urine are contained. Women have besides the eighth for the foetus, called *garbhāśaya*. The internal organs (*koṣṭhāṅga*) are 15 according to Caraka (and Viṣṇu, Yājñ.), viz. heart, lungs, liver, spleen, bladder, stomach, rectum etc. The seven basic elements (cf. § 34) are separated from each other by the 7 *kalās* which consist of a fluid extract from the basic elements (*dhātu-sāra*) which is compared with the substance of wood. The *kalās* contain or surround, according to their names, flesh, blood, fat, phlegm, faeces, bile and sperm. The second *kalā* which contains blood is found, according to Suśruta, in flesh, particularly in the arteries, spleen and liver, wherefore blood flows out in wounds of flesh just as milk-juice flows out from a tree containing such juice. The nine openings (*srotas*, *kha*, *chhidra*) are the mouth, nostrils, ears, eyes, anus and urinary canal. In the case of women there are in addition the breast and vagina. The ten chief places of life (*prāṇāyatana*, *jīvitadhāman*) are head, neck, heart, navel, anus, bladder, *ojas* (vitality), sperm, blood, temples and the tongue (AS, AHr, Viṣṇu, Yājñ.). The quantities of fluid parts are given in *añjalis* "handful"; thus the body contains 10 *añjali* water, 5 *añjali* bile etc. The seven basic elements (*dhātu*) create seven excretas (*mala*), viz. phlegm, bile, secretions of ears, nose etc., perspiration, nails and hair, eye-dirt and fatness of skin. *Mala* has another and more general meaning. Thus Manu 5.135 distinguishes 12 *malas* : fatty secretion of skin, sperm, blood, marrow (brain), urine, faeces, nasal phlegm, dirt in ear, phlegm, tears, eye-dirt and sweat. According to Bhāv., the *malas* are innumerable like the hair and pores (Car 4.7; Su. 3.4 f.; AS 2.5; AHr 2.3; Bhāv 1.1. 55 f.).

The joints (*saṁdhi*) are exhaustively described. According to Suśruta, they are 210 : 68 in the extremeties, 59 in the trunk and 83 above the neck. The joints in the extremeties,jaw and hip are movable, the remaining are immovable. To these joints on the bones are added the innumerable ones in muscles, sinews, nerves and arteries. The number of *snāyus* (sinews and nerves, literally 'bindings') is 900 : 600 in the extremeties, 230 in the trunk and 70 above the neck. There are 500 muscles (*peśī*) : 400 in the extremeties, 66 in the trunk and 34 above the neck. Women have 20 more : 10 in breast which develop only after puberty, 4 in vagina, 3 in uterus and 3 for the propagation of semen and blood. The 700 vessels (*sirā*) starting from the navel moisten the body, just as a garden is watered by water-trenches. Mention is made of 10 basic vessels (*mūlasirā*) in the heart which lead *ojas* through the whole body (AS), and also of 72000 tubes (*nāḍī*) which start from the heart (Yājñ). One hundred and seventy five vessels contain wind, and an equal number of them contains bile, phlegm and blood. The wind-vessels are reddish and are full of wind, the bile-vessels are hot and blue, the phlegm-vessels are cold, whitish and immovable, the blood-vessels are red and lukewarm. In blood-letting certain vessels are to be avoided. The 24 (according to Car, Viṣṇu, Yājñ. 200) reeds (*dhamanī*, i. e. vessels and nerves) start likewise from the navel, yet it is denoted as an error to consider them simply as a sub-section of *sirā*. Ten *dhamanīs*, going upwards, cause the five sense-functions, viz. the breathing in and breathing out, yawning, sneezing, laughing and speaking. Ten going downwards, conduct downwards the wind, urine and faeces, sperm and ovum, and four, running circular through the body with innumerable branches in the whole body, throw out perspiration. According to Car, Viṣṇu, Yājñ, there are 3956000 (2900956) *sirās* and *dhamanīs*. The *srotas* are another kind of canals of which there are two each for the breath,food, water, chyle, blood, flesh, fat, urine, faeces, sperm and ovum. Important for the physician's practice are the 107 *marman* i. e. dangerous points in flesh, arteries, sinews, bones and joints, the places of which are sufficiently described. They are also divided from the view-point as to whether wounds are forthwith fatal,or bring death only after some time or are fatal after extracting an arrow or similar foreign matter, or only cause lameness or pain. To the first class of *marman* belongs the heart which is the seat of three gunas and of spiritual activity (Su. 3.6.30; AHr 2.4.13;Aruṇadatta). There are 16 sinews (*kaṇḍarā*)

which end in nails, 16 networks (*jāla*), 6 fibrous aponeurosis (*kūrca*) on the hands, feet and in the neck, the 4 cords (*rajju*) in the spinal cord, and 7 sutures (*sevanī*, 5 in head, one each on the tongue and on the penis). These must be avoided in operations. There are also 14 " bone-groups " with the corresponding " dividing lines " (*sīmanta*, Car 4.7; Su 3. 5–9; AS 3. 5–7; AHr 2.3 f.; Bhāv l.c.)

One third of the eye consists of the black part (*kṛṣṇamaṇḍala*) the seeing organ (*dṛṣṭi*— the pupil or lense) occupies one seventh of the black part. The eye contains 5 circles, viz. the eyelashes, eyelids, the white part (*śveta*), the black part and the *dṛṣṭi* (pupil). There are six joining places (*saṁdhi*), viz. between the eyelashes and eyelids, between the eyelids and the white, between the white and the black, between the black and *dṛṣṭi*, on the eye-star (*kanīnakā*) and on external eye-angle. There are further two membranes (*paṭala*) on the eyelids, and four on the eye; one of these four is connected in fact with the transparent substance (*tejojala*) and these four are affected by the frightful disease *timira* (Cataract). Their diameter carries altogether a fifth of *dṛṣṭi* (Su 6.1; AS 3.5).

(1) A musical-work, *Sangitaratnakara* of the middle age also contains a comprehensive representation of embryology and anatomy which intimately agrees with Su and Car. (R. Simon). Cf. Sangitaratnakara (ASS 1897) I, pp. 14 ff. On the Amarakosa see Weber, (2nd edn) p. 286; on the Upanisads, cf. § 14. *Indische Litteratur.*

§ 36. **Dissection** :— Some sort of dissection is mentioned only in Su 3.5. A surgeon who desires to obtain a definite knowledge of human body, should properly clean a body in order to learn to know the position of the organs. The dead body to be selected for this purpose should be of a man with complete limbs, who did not die of poison or of a protracted disease (on account of the morbid changes of the body resulting thereby–Ḍallana), or was of over age. Having removed all excremental matter from the entrails, the body should be placed in a cage fast tied (so that it may not flow off by the current –Ḍallana) in not a rapid current after wrapping it with rush or bast or Kusa grass or hemp (so that it may not be devoured by fish and other animals in water–Ḍallana) in a covered place (where it would be safe from the attacks of birds of prey-Ḍallana). There the body should be allowed to decompose. When, after seven days, it is thoroughly

decomposed, it should be taken out and very slowly scrubbed with a whisk made of khas (*uśīra*) or hair or bamboo gradually and the internal and external parts (which have become visible), beginning with the skin, should be fully examined with the eye. One cannot see the soul with physical eyes, but with the eye of knowledge and penance. Since this procedure is recommended only to the surgeon, the anatomical knowledge thus received may not obviously be considered as necessary for the treatment of cases other than the surgical ones.

§ 37. **Philosophy and Cosmology** :— The philosophy of medical authors is essentially that of the Sāṁkhya system[1], as is evident from the fact that Punarvasu (Car 1.13.3) imparts his instructions to the followers of this philosophy (*sāṁkhya*) who surrounded him. So also Su 3.1 denotes the "unexpanded" (*avyakta*) which consists of three *guṇas* : *sattva*, *rajas* and *tamas*, as the creative element of the whole world. From *avyakta*, " the great " (*mahān*) originates, and from this " the inspirer of I " (*ahaṁkāra*) in three forms : *vaikārika*, *taijasa* and *bhūtādi*. From the first form of *ahaṁkāra* the eleven senses (*indriya*) are created; they are (1) the five senses of perception : hearing, feeling, sight, taste and smell. (2) the five active senses : speech, catch and hold, procreation, evacuation and walking, the respective organs for these senses and (3) the internal sense (*manas*). From the third form of *ahaṁkāra* are created the five *tanmātra* (" only this ") i. e. the basic elements of the sound, feeling, colour, taste and smell and from these the gross elements (*bhuta*) : vacuum[2], wind, fire, water and earth. Thus there are 24 principles (*tattva*). Of these *avyakta*, *mahān*, *ahaṁkāra* and the five *tanmātra* are the eight basic forms (*prakṛti*), the remaining 16 are the products (*vikāra*). In opposition to the 24 irrational tattvas, there is the 25th endowed with intelligence (*cetayitā*); it is the soul (*puruṣa*). Like the basic element or the matter (*prakṛti*) the soul is also without beginning and end, eternal and omnipresent. While, however, the matter is uniform and non-intelligent, consists of three guṇas, propagates itself and does not remain neutral, there is a variety of souls who are endowed with intelligence, are immaterial (*aguṇa*), unproductive and neutral. Car 4.1 speaks of the soul as the *cetanādhātu* who is named as *puruṣa* and consists of the 24 above elements. The *puruṣa* is without beginning and eternal, the designations *ātman*, *kṣetrajña*, *vibhu*, *sākṣin* are also applied to Him. If there were no *puruṣa*, there would

neither be light nor darkness, neither truth nor untruth, no Veda, no good or bad deeds, neither pleasure nor pain, neither birth nor death, neither bond nor release. At the dissolution of the world (*pralaya*) a counterformation takes place also in the case of the *puruṣa*, the folded becomes unfolded and *vice versa*. After death the expressions of the soul's activity, viz. pleasure and pain, comprehension and recollection etc. cease, the body becomes like an empty house and devoid of conciousness after the removal of the soul. Caraka holds similar view with Suśruta in respect of *avyakta*, *buddhi* (*mahān*), *ahaṁkāra*, five *tanmātra*, five senses of perception and five of activity, *manas*, five gross elements (*khādīni*) and the 16 *vikāras*. In 4.5 Caraka speaks of the redemption and the means therefor. According to Car 4.6, the body is the product of five gross elements (*mahābhūta*, see above) under the guidance of the soul. If the balance of the elements is disturbed, the body suffers or expires. Decrease or increase of individual elements occurs by unsuitable or suitable diet and the like. In 1.8 the relation of the senses to the soul or inner sense, *manas*, also called *sattva* or *cetas*, is exhaustively discussed. The senses can take hold of their respective objects only by the direction of the soul. The way in which the spirit or character of every individual man is formed, depends upon as to which of the three *guṇas* (*sattva*, *rajas*, *tamas*) is dominant in him. Compare also § 41.

The principle of three *guṇas*, the *prakṛti* and the 25 *tattvas* is presented in detail in Bhāv 1.1.9 ff.

The organic world is usually divided into four classes : *svedaja* or *ūṣmaja*—originating from heat (insects), *aṇḍaja*—originating from egg (birds, serpents etc.), *udbhijja*—originating from a shoot (plants), *jarāyuja*—originating from a womb (men etc.). This division need not necessarily start from the Sāṁkhya philosophy[1].

(1) Cf. Garbe. *Die Sāmkhya Philosophie*, (Leipzig 1894), *Samkhya und Yoga* (Strassburg 1896, Grundr. III. 4). To the proofs exhaustively given therein (44 ff. and §§ 10-15) about the works influenced to a great extent by this system may be added the medical text-books as well. (2) Cf. Bohtlingk, *Die funf* Elemente *der Inder und Griechen* (Ber. d. Sachs. Ges. d. Wiss. 1900). (3) cf. e. g. Deussen, *System des Vedanta*, p. 259.

§ 38. **Pathology** :— Since illness is the result of the derangement of the tridoṣas (§ 33), it gives a hint to divide from this viewpoint all the diseases which are 1120 according to Su 6.66.8 and are innumerable according to Car 3.6.5. Thus Car 1.20 counts 80 diseases proceeding from vāta, 40 from pitta and 20 from kapha, and remarks that these ailments are really speaking innumerable. To these are added the diseases that are accidental or due to external causes (*āgantu*) as a fourth group, viz. those caused by scratching, biting, tumbling, acts of violence, possession, enchantment, malediction, strokes, captivating, pricking, choking, squeezing, knitting, burning wounds, weapon, lightning stroke or demoniac influence. As general characteristics of vāta-diseases Caraka mentions dislocation, trembling, unrest, pain in limbs, redness of skin, astringent taste in mouth, deafness and dumbness, crookedness of limbs, lameness etc. Symptoms of pitta-diseases according to him are burning, heat, inflammation, perspiration, moistness, rotten ulcers, redness, bad smell and taste, and decolorization. Symptoms of kapha-diseases are white colour of the skin, cold, itch, stiffness, tumour, heaviness, numbness, moistness, sweet taste, slowness etc. These general symptoms undergo modifications corresponding to the individual diseases, as will be evident from their descriptions. According to Car 3.6 two doṣas in different combinations or all three doṣas can also be responsible for the origination of a disease (*saṁsarga* and *saṁnipāta*) which then becomes prominent in the description of the disease. The worst diseases have their origin in *saṁnipāta* which is a combination of three doṣas. Car 1.11 calls the diseases caused by the doṣas as *nija*, those proceeding from demons, poisoning, wind, fire, strokes and the like (cf. above) as the second group (*āgantu*) and the mental excitements and mental worries as the third group (*mānasa*). Similarly there are four groups according to Su 1.1 : *āgantu* i. e. proceeding from wounds, *śārīra* i. e. abnormal increase or decrease of vāta, pitta or kapha or blood proceeding from food or drink, *mānasa* i. e. anger, grief, anxiety, pleasure and other mental excitements, *svābhāvika* (natural) i. e. hunger, thirst, oldage, death and sleep. Inherent diseases (*sahaja*) like inherent blindness are also included elsewhere (Bhāv 1.1.15) among the *svābhāvika* which (as well as the *mānasa*) cannot properly be called diseases. The classification in AS 1.1, AHr 1.1 is more logical. They distinguish only two groups, *nija* and *āgantu*, with the additional remark that they have their place either in body or in mind. Aruṇadatta remarks here

that in *nija* the derangement of *doṣa* occurs first and then the disease, while in *āgantu* the derangement of *doṣa* is secondary and that by mental diseases swoon, apoplexy, madness, possession, epilepsy and similar conditions are to be understood.

The derangement of the balance of *doṣas* is caused chiefly by unsuited diet, yet other conditions are also responsible for it. Thus vāta is deranged also by fight with strong people, excess in movements, in sexual intercourse or in study, tumbling, running, pressure, wounds, fasts, bath, swimming, keeping awake at night, carrying heavy load, riding on an elephant or horse, driving or walking and suppression of natural needs. Pitta is deranged by anger, grief, anxiety, exertion, fast, indigestion and sexual extravagance. Kapha is deranged also by sleep by day, want of activity and inertia. Besides, the seasons and daily changes of time and the various stages of digestion also influence the dosas, as e. g. the kapha is deranged particularly in winter and spring, in the morning and evening and immediately after the meal. The derangement of dosa is compared with the fermenting process. The vāta gives impetus and drives the dosas around in the body in which they cause various pains and troubles according to the place of their appearance (Su 1.21). The therapy is aimed at allaying or suppression (*praśamana*) of the only or chiefly deranged *doṣa*.

The same pathological effect as that of the tridosas is attributed to the blood as well, cf. § 33. According to Su 1.21 derangements of blood are caused by the derangement of pitta and by frequent use of liquid, oily and heavy food, sleep by day, anger, fire, sunheat, fatigue, wounds, indigestion, unharmonious or excessively eaten food and the like; similarly Car 1.24. Fifteen kinds of derangements occur according to Su 1.c.15 from the derangements of the tridosas and the blood, individually or in various combinations. According to Car 1.24.4 all the diseases that are curable in themselves and which resist the application of remedies that are cold and hot, oily and dry, and similar other remedies, are caused by deranged blood (*raktaja*). The derangements of other six *dhātus* (Cf. § 34) also cause analogous effects. Thus spoiled *rasa* brings about loss of appetite, gout, fever, impotency, thinness and other diseased conditions; spoiled flesh brings about swelling of gums, tumour, goitre etc.; spoiled fat brings about abnormal height or abnormal dwarfishness, abnormal fatness or abnormal

leanness etc.: spoiled bones bring about exostosis, caries, various diseases of teeth etc.; spoiled marrow brings about swoon, giddiness, pain in joints etc.; spoiled sperm brings about impotency or infirmity of children or miscarriage etc. (Car 1.28; Su 1.24). Similarly various stages of many diseases, e. g. *kuṣṭha* (§ 68), are explained by their place in various *dhātus*.

Along with his above fourfold division, Su 1.24 mentions also another division of diseases in 7 classes : *ādibalapravṛtta*—proceeding from procreation, i. e. from spoiled sperm and ovum, thus inherited from father and mother; e. g. skin-diseases and piles. 2. *janmabalapravṛtta*— proceeding from the birth, i. e. in the womb by defective conduct of pregnancy, like lameness,inherent blindness, dumbness and deafness, speaking through the nose, dwarfishness and the like. 3. *doṣabalapravṛtta*— proceeding from the dosas, in fact originating either in intestines or in stomach, either in body or in mind. 4. *saṅghātabalapravṛtta*—proceeding from wounds, i.e. caused either by weapon or by beasts. 5. *kālabalapravṛtta*—originated from the seasons, i. e. brought about by cold, heat, wind, rain and the like. 6. *daivabalapravṛtta*— caused by the divine will, i. e. effected on account of an insult of a divine being, effected by imprecation,incantation from the Atharvaveda or by contagion (Ḍallaṇa). The effects of lightning are also reckoned herein. 7. *svabhāvabalapravṛtta*— natural, i.e. hunger, thirst and the like (see above). Susruta, however, expressly adds that vāta, pitta and kapha form the root of all diseases.

According to the grade of their dangerousness, the diseases are divided into three kinds : curable (*sādhya*), only mitigating (*yāpya*) and incurable (*pratyākhyeya*, *anupakrama*, *asādhya*). Reference is always made to this division in the description of diseases. Chronic diseases are understood by *yāpya*; these may be temporarily checked by suitable medicine or remedies, but cannot be cured. In Caraka, therefore, they form a section of incurable diseases. On the other hand, the curable diseases are divided by him into those that are curable easily and those that are curable with difficulty (Su 1.35.18; Car 1.10. 7-10; AHr 1.1.30-32). To the difficult diseases belong the surgical cases (*sastrādisādhana*, AHr 1.1.32). Su 1.24.3, therefore, remarks that in surgical cases the application of medical remedies is not inadmissible, on the other hand in the cases of diseases curable by medical remedies operation is not to be resorted to.

From the standpoint of the principle of rebirth, those diseases are considered as *karmaja*, i.e. proceeding from the misdeeds in a previous birth, for which there appears no visible cause and which resist the usual curing methods. One must try to cure them by penance (*prāyaścitta*). Where serious ailments arise out of trivial causes, it is due to a combined effect of the *doṣas* and previous misdeeds (AHr 1.12. 57 ff.; Bhāv 1.1.126).

The study of a disease in the beginning stage is called *prāgrūpa*, *pūrvalakṣaṇa*, the characteristic symptoms are called *lakṣaṇa*, complications are called *upasarga*, *aupasargika*.

Epidemic diseases (*maraka*, *janapadoddhvaṁsa*) proceed particularly from continuous draught, excessive rainfall and similar calamities which are sent by gods as punishment for sins, or from the evaporation of poisonous plants, the influence of stars etc. As a measure of relief the infected region should be abandoned or the epidemic should be subdued by expiating ceremonies etc. (Car 3.3; Su 1.6).

The simplest and most natural classification is that which is based on the place of the disease in the body (*rogamārga*) : 1. The external diseases (*bāhyaroga*) i. e. skin-diseases, haemorrhoids, tumours etc. 2. Diseases of inner organs, e.g. vomiting, diarrhoea, cough, fever and the like and 3. those of the middle organs, e. g. consumption, hemiplegia, headache etc. (Car 1.11.48 f.; AHr 1.12.44 ff.) Of the eight subjects of medicine (Su 1.1) the second is related to the diseases of ears, eyes and other parts above the clavicle, the third to the diseases of the whole body, like fever, diarrhoea, madness etc. Besides, the possession by demons, children's diseases and poisoning form part of this subject.

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IV. Theory of Development and Gynæcology

§ 39. **Menstruation and Conception**[1]:—The menstruation begins at the age of 12 and stops at the age of 50 years (Su 3. 3.11; AS 2.1.196; AHr 2.1.7; Bhāv 1.1.16). With regard to the male race the age of 16 years forms the earliest limit for the attainment of puberty which extends to 70 years at the most (AS). Yet it has been recommended to a young man to marry[2] a 12 years' girl at the age of 21 and to create at the age of 25 a son from a wife of 16 years, because they then are fully developed and create strong progeny. If at the time of procreation the father is less than 25 and the mother less than 16 years' old, the foetus dies in the womb or if at all it is born it does not live long or remains crippled, weak and sickly (AS 2.1.195; AHr 2.1.9; Su 3.10.54 f.). In the selection of a wife, it is to be seen that no contagious or hereditary diseases exist in her family (*asaṁcārirogakula*— AS). Manu 3.7 mentions special families in which haemorrhoid, consumption, dyspepsia, epilepsy, white or black leprosy prevail.

The conception depends upon the coincedence of sperm and menstrual blood. Mention is also made of the sperm of women, yet it is expressly stated that it has no influence in the formation of the foetus (AS 2.1). Sperm is the juice (chyle–*rasa*) consisting of the food properly digested and transferred into the marrow. As butter is contained in the milk or sugar in the juice of sugarcane, so the sperm is contained in the sperm–keeping substratum (*kalā*) which pervades the whole body and particularly in the marrow, the testicles and the nipples. The menstrual blood also results every month from the chyle. The vāta drives out from the hymen the blackish and smell-less blood collected during a month through both the vessels of uterus (Su 1.14.1 f.; 3.4.13 ff.; 2.2.1 f.; AS 2.1.195; 198; AHr 2.1.7). In order to create a normal foetus, the sperm and menstrual blood must be clean i. e. must be of normal condition. The sperm is not capable of generating, if it is deranged by the doṣas or by impure blood, whereby it becomes thin, frothy, brown, scanty, painful, flowing slow, yellow, too plentiful, does not sink in water etc. As far as its smell is concerned, incurable impotency is to be diagnoised if the sperm smells like urine or faeces. The law–books also prescribe a test of potency before marriage by which it is ascertained among other things that the

sperm sinks in water (Nārada 12.10). The menstrual blood can have defects similar to male sperm. Nutritive and sweating remedies,specific diet and douches are particularly recommended for cure, while in the case of women it is laid down to use pastes and cloth or cotton (*picu*) which are inserted in the vagina, as well as cleansing with water. The sperm capable of generating is fluid, frothy, sticky, heavy, plentiful, sweet, whitish, resembling honey in smell and colour or of the colour of butter or oil. The menstrual blood is pure if it resembles the blood of hare or lac-colour and leaves no stains in washed clothes (Su 3.2.3–17; AS 2.1.196 f.; AHr 2.1.10–19). Excessive flow of blood during or after the menses is called *asṛgdara*, *pradara* (§ 49).

In the period suitable for conception (*ṛtu*) the face of the woman is full (slender–AS, AHr) and clean, her body, mouth and gums become moist, she is desirous of her husband, is lovely, her body and her eyes are sunk down, her hair fly around, her arms, breast, hips, navel, thighs, genitals, buttocks are in a palpitating movement and she has strong desire for enjoyment (Su 3.3.7 f.; AS 2.1.198; AHr 2.1.21 f.). The twelve nights after the beginning of menses excluding the first three form the period suitable for conception, and the child will be a male one if the conception takes place on even days i. e. 4th, 6th, 8th, 10th or 12th day, and a female one if on odd days i.e. 5th, 7th, 9th or 11th (Su 3.2.28–30;3.3.6; AS 2.1.199; AHr 2.1. 27 f.) According to a more rigorous conception, the eleventh night is also prohibited (AS, AHr); one should indeed wait for four days more after the course of menses in order to aim at excellent sons (AS). On the other hand, there is a reference to a 16 days period suitable for conception (AS, Bhāv 1.16, Ḍallaṇa on Su 3.3.6). It corresponds with the statement of law-books (Manu 3.46; Yājñ 1.79) and is therefore original. Of the 16 days, 12 days remain by subtracting four days of menstruation, and out of these 12 days first three days are again to be avoided. The sperm arrived during the bleeding in the uterus is compared with an object thrown in flowing water which is swept away by the stream. If the conception takes place on one of the first three days,the child dies at or after the birth, or becomes at least crippled or short-living (Su 3.2.31). After the period of *ṛtu*, the uterus does not allow the sperm to penetrate, just as the lotus closes itself at the end of the day (Su 3.3.9; AS 2.1.198). On the first three days of the menses the woman should remain chaste,

should neither bathe nor adorn herself, should lie on a low bed of Darbha-grass, should take nothing more than some milk-pap, for which she must use her flat hand, earthen vessel or leaf as a plate and observe other abstinences (Car 4.8.5; Su 3.2.25;AS 2.1.198; AHr 2.1. 23–25). Every violation of the discipline laid down for her would injure her progeny. Her child would be lethargic if she sleeps by day, blind if she uses eye-ointment, suffering from eye-disease if she weeps, leper if she anoints her body with oil, mad if she speaks too much, deaf if she hears a loud noise (Su l. c.; Bhāv 1.1.17). When after the course of three days she has taken the usual cleansing bath, has worn fresh clothes and ornaments, it is to be seen that she immediately gets to see her husband, because her son will resemble the first man whom she sees after her bath. A ceremony *(putrīyavidhi)* intended for obtaining male progeny precedes the matrimonial cohabitation which corresponds to the *garbhādhāna* of the Smṛtis and Gṛhya sūtras. The mantra RV 10.184.1 is recited there at that time (Cf. Speijer, *Jātakarma* p. 18). A *ṛtvij* places in her vagina an oblation for Prajāpati (Car 4.8.9–10; Su 3.2.25; AS l. c.; AHr 2.1.28 ff.). The husband should ascend the matrimonial bed first, with the right foot, the wife with her left foot. At the time of generation the menstrual blood is dissolved (by the heat produced) just as the butter melts in fire (Su 3.2.36). The sperm is of watery quality and the menstrual blood of fiery quality;yet other elements (earth, atmosphere and wind) are also contained therein. In the union of husband and wife, wind expels from the body the heat (produced by the contact of her organs), by the connection of heat and wind the sperm comes out following the pleasant feeling *(harṣa)*, arrives in the uterus and is united with the menstrual blood. Thus the foetus is created when the spirit *(jīva, cetanādhātu)*, quick as wind and impelled by his deed in an earlier birth *(karman)*, enters it as the sixth element. If the sperm preponderates a male child is born, if the menstrual blood prevails a female child is generated, if both of them exist in equal quantity a creature incapable of generation *(napuṁsaka, klība)* is born. Moreover, the generation of female progeny rests on odd days, because on these days the menstrual blood increases in quantity (Su 3.3.3–5; Car 4.2.11 ff.; 22 ff.; 4.4.7 f.; 2.2.201; 2.1.199; AHr 2.1.5). Triplets and groats are generated if the sperm and menstrual blood are divided internally by air and thereby an equal number of souls is received in the uterus. Twins are considered as

an abnormality, so Ḍallaṇa on Su. says that a penance must be observed at the birth of twins. Various weaklings and sexual abnormalities are created by deficiency of the sperm or defective quality of the sperm or womb or unnatural voluptuousness of parents and other irregularities (Su 3.2.37 ff.; Car 4.2.17 ff.; AS 2.2.203–5). Generally born deficiencies of every kind can also originate from sins in a previous birth or sins of the parents (Su 3.2.52; 58 etc. Cf. § 3).

(1) Cf. here as well as for the following paragraphs, Vullers, *Altindische Geburtshilfe* (Janus 1, 226-56, Breslau 1846); Fasbender, *Entwicklungslehre, Geburtshulfe und Gynaecologie* (Stuttgart, 1897 pp. 300).
(2) Similarly Manu 9.94. On the child-marriage, see *Recht und Sitte*, § 17.

§ 40. **Pregnancy** :— The following symptoms appear after the conception : weariness, atony, looseness of limbs— particularly of the thighs, a feeling of heaviness, palpitation of the heart, salivation, nausea, thirst, goose-skin, palpitation in the vulva, retention of the sperm as well as of menstrual blood. The pregnancy is known by the following signs : vomiting, nausea, desire for sour food, dislike for fragrance, heaviness in limbs, closing of eye-lids (by weariness), sleepiness, yawning, swooning, black colour of the skin around the nipples and the lips, swelling of the feet, creation of breast-milk and swelling of the breasts,appearance of hair on linea alba below umbilicus, abnormal appetite etc. (Car 2.22;4.9; Su 3.3.13–15;AS 2.2.202;AHr 2.1.35 f.; 50–52; Bhāv 1.1.23). The menses cease, because the canals leading menstrual blood are stopped by the foetus, so that the same is directed partly downwards to the placenta *(aparā)*, partly upwards to the breasts which, therefore, become full and raised (Su 3.4.24; AS 2.2.202). That the pregnant woman bears a son is known from the fact that milk is created first in her right breast, that her right eye becomes bigger, that she starts walking with the right leg, her desire in pregnancy tends mostly to food, drink and other things with masculine designations, dreams of blue or white lotus-flowers, mangoes and other things of masculine designations, the foetus stands on the right side, she does not desire her husband and so forth. From the opposite symptoms one should anticipate a female foetus; the woman in this case also likes dance, music, singing, fragrance and wreath of flowers (AHr). If the body of the woman is arched forward in the middle, while at the same time there is a combination of both the above-mentioned types of symptoms, she bears an impotent or a hybrid (*napuṁsaka, klība*). If both the sides of the body are raised, the middle part has gone deep, so that the body has a

form of a watertrough (*droṇī*) deepened in the middle, then she bears a twin (Car 4.2.28 f.; Su 3.3.34; AS 2.2.204; AHr 2.1,69–72). After pregnancy is sure the ceremony *puṁsavana* takes place in order to aim at a son according to the Gṛhya sūtras[1] under the puṣya constellation when three or four drops of milk mixed with an extract of *Ficus Indica* and other herbs are dropped in the right nostril of the woman as a snuff. She is not to let the fluid flow out. If the husband desires a daughter,he puts the fluid in the left nostril of the woman (Car 4.8.20; Su 3.2.32; AS 2.1.200; AHr 2.1.37–42). Herein are included,according to the Gṛhya sūtras[2] the usages which aim at the prevention of a possible abortion (*garbhasthāpana*) particularly if after the signs of pregnancy menses occur from the fourth month onwards or there is acute pain in the bladder,lateral parts,hips and entrance of the vagina. The woman should be made to lie down on a soft and cool bed with the head a little sunk down; a wet clothpiece with certain substances applied to it should be inserted in her vagina and urinal canal; her lower body between the navel and the genitals should be smeared with certain fluids and she should be made to have a cold tub bath. She should also pull on clothes which are made wet with juice of milky trees; she should carry "important herbs" on head and in the right hand, should take milk or butter prepared with it, and use internally and externally "animating herbs" in general (Car 4.8.33 f.; AS 2.1.200; AHr 2.1.41 f.). Danger threatens the foetus, if the desires of the pregnant woman are not attended to. Analogous to the development of organs *(indriya)* in the third or fourth month, the life-sensation occurs in the foetus, it begins to palpitate and to carry longings for all that (according to the belief in the theory of the rebirth of the soul) it experienced in the previous life.This condition is called *dvaihṛdayya* ('twoheartedness') or *dohada*[3] in relation to the two hearts of the mother and the foetus which stand connected with each other through the canal mediating the feeding of the foetus, whereby similar movements and desires occur in both the hearts. Therefore, one should not refuse to the woman the fulfilment of her desires, otherwise the deranged vāta will pervade the body and thereby the foetus would come out either in an expired condition or as a child which is hump-backed, lame, dwarflike, weakminded, or otherwise abnormal. On the other hand, by satisfaction of her desires she will beget a strong and long-living son (Car 4.4.16–19; Su 3.3.18; AS 2.2.202 f.; AHr 2.1.52–54).

The pregnant woman must generally live very cautiously. She should avoid over-exertions, sexual intercourse, fasts and too strong a purgative, sleep by day and keeping awake by night, grief, ascending a carriage, anxiety, sitting (on the floor), untimely blood-lettings, suppression of natural excretions and the like. In a diseased condition her foetus has also to suffer in the same organs in which she has to suffer (Su 3.3.16 f.). From the first day of her pregnancy upto the confinement the woman should always be in fair disposition and clean in body, should adorn herself with ornaments and white clothes, perform expiating and fortune-bringing ceremonies, worship gods, Brāhmans and respectable persons, touch nothing dirty or deformed, avoid what smells bad or looks bad, should not hear exciting speeches, should not eat dry, stale, stinking or moist food, should not go out, should not go into an empty (abandoned) house or temple,a burial place,or under a tree, guard herself from anger, terror and carnal lust, should not carry heavy load,should not speak excessively loudly and should avoid (generally) all what could injure the foetus. She should also not anoint or smear herself often or should not be physically tired and should observe the same rules as in menstruation (Cf. § 39). Her seat or bed should be soft, not too high, provided with a back and not too narrow. Her diet should be stimulating, fluid, predominantly sweet and prepared in an appetite-stimulating manner (Su 3.10.3). Similar list of injuries of the foetus (*garbhopaghātakara*) is found in Car 4.4.18 and 4.8.16; AS 2.3.206. If the woman is quarrelsome, her child will be suffering from epilepsy; if she is a drunkard it will be thirsty or weak in memory or unsteady; if she eats buffalo-flesh with zest it will be warlike, red-eyed and hairy; if she likes to eat sweet things it will suffer from diabetes, will be dumb and shapelessly thick;if she likes to eat pungent things it will be weak, poor in sperm or childless and the like (Car l.c.; AS 2.3.206 f.; Su 3.3.19–28). The desires of the pregnant woman (see above) can also have favourable effect on the foetus. Thus the child will be wealthy and genteel if the woman has a desire to see a king; virtuous and holy if she has a desire for solitude (Su l.c.). Diseases of the pregnant woman should be treated only with mild, sweet, cooling and agreeable remedies. Vomiting substances, purgatives, blood-letting and such severe remedies are to be avoided; because the pregnant woman is like a vessel full of oil which is not to to be allowed to waver (Car 4.8.23). For each month of pregnancy a particular diet is prescribed, the main part of which consists of milk

along with ghee, butter-milk and cream. In the eighth or ninth month the woman must take an oily enemeta in order to throw out old excrements from the body and to bring about a favourable birth-wind (peristalsis). Then a piece of cotton soaked in oil should be inserted in the vagina in order to make the vaginal passage smooth (Car 4.8. 25; Su 3.10.4; AS 2.3.208; AHr 2,1.59–68). The birth takes place in the 9th, 10th,11th or the 12th month (Su 3.3.30), to speak accurately in the period commencing with the first day of the ninth lunar month to the end of the year (Car 4.4.25; AS 2.2.203; AHr 2.1.66).

(1) Hillebrandt, *Ritualliteratur*, § 9. (2) l.c. § 10., cf. also *Kausika Sutra* 35.12 ff. (3) Luders, *Sanskrit dohada*, Gotting. Nachr. 1898, 2-5; Aufrecht, *Dohada*, ZDMG 52,p.763; Jolly, *Sanskrit dohada, dauhrdayya*, IF, 10,213-15. Bohtlingk explains Dohada from doha + da = causing milk-secretion i. e. " desires for that which produces milk " (ZDMG 55, p. 98).

§ 41. **Embryology :—** To the theory of conception laid down in § 39, it is to be added that according to the principles of philosophy the soul entering the womb is an emenation of the Universal being (cf. § 37). Just as at the destruction and creation of the world the Creator, the Universal being (*brahma*), the omnipotent original spirit that causes everything, the eternal, the fountain-head, the highest,the unexpanded being,first creates the atmosphere at the creation of the world, and then successively the four remaining elements, (wind, fire, water and earth) with highly developed qualities (*guṇa*), similarly while entering into the human body, he first receives in himself the atmosphere, then the wind and the remaining elements with highly developed qualities. This whole process of reception of qualities, however, is completed in an infinitely short time (Car 4.4.7–8; cf. Yājñ 3.67–74; Visnu 96, 51). In the first month the foetus is a collected small mass covered with the five elements. In the second month it becomes a solid ball, a (lengthwise) flesh-excresence, or a round (a half globe-formed—Ḍallaṇa, " Budlike "–Bhoja) mass (*arbuda*). Cold, heat and wind bring about its development. Further it becomes a male, female or a neuter (*napuṁsaka*). In the third month the body develops in five directions (AS) : [1] bones, [2] arms, [3] head, [4] seats for all the organs excluding things like teeth and symptoms of puberty which develop only after the birth, and [5] all senses. From wind are created the feeling, the sense of feeling, hoarse-

ness, action, the expansion of the elements (of the body) and the movements; from fire the colour, sight, light, digestion and warmth; from water the taste, the sense of taste, coolness, softness, smoothness and moistness; from earth the smell, the sense of smell, weight, solidity and form. The phenomena that appear in the world also appear in men (Car 4.4.8–10; cf. Yājñ 3.75-78). With the creation of senses coincides also the development of the power of discrimination, the occurance of child's movements and the desires of the pregnant woman. See above § 40. According to Su 3.3.18, this takes place in the fourth month. In the fourth month all parts of the body and the heart take a definite shape and the foetus becomes fixed. In the fifth month flesh and blood increase to a greater extent than in other months according to Caraka, which accounts for the general weakness of the woman in this month. The soul also becomes more animated in this month. In the sixth month hair on the head and body, nails, bones, sinews, arteries etc. are formed, the vigour and complexion of the foetus also increase. This is why, according to Caraka, vigour and complexion of the woman become particularly faded in this month. In the seventh month the foetus is provided with all limbs and is endowed with all requirements of existence (so that a child born in this month is capable of living, even though on account of early birth it may not live long–Aruṇadatta on AHr 2.1.58). The woman, therefore, becomes particularly fatigued in this month. In the eighth month the vitality *(ojas)* is led sometimes from the mother to the child, sometimes from the child to the mother through the canals carrying chyle. On account of this interchange of vitality, the child born in this month may not be capable of living, the mother as well as the foetus are sometimes bright, sometimes depressed and the mother's life is also in danger. In order to avoid delivery in this month, an oblation of flesh and rice is offered to the demon Nairṛta. Regarding time of birth see § 40 (Car 4.4.11–24; Su 3.3.30; AS 2.3.202 ff.; AHr 2.2. 49–66; cf. Yājñ and Viṣṇu l. c.). The aforesaid theory of development, even though predominant (cf. also Garbhopaniṣad in Deussen's *60 Upaniṣads*, p. 608), is not the only one. Thus Su 3.3.32 mentions the views of more ancient writers according to whom the head takes form first, because organs of senses are rooted in it; or the heart, because it is the seat of intelligence and the soul; or the navel, because through it the human body develops; or the hands and feet, because the movements of the foetus start from them; or the middle of the

body, because the generation of all limbs depends on it. These different views are, however, not approved by Suśruta, because all limbs exist in germ in the beginning, and are not visible in the undeveloped foetus on account of their small size. The development is compared to the fibres, flesh, kernel and marrow of a mango which become visible only in the ripe fruit, or to a bamboo tree that develops from a bamboo shoot. Cf. Car 4.6.21.

During pregnancy the foetus is in the uterus, turned towards the back of the mother, the head above, hands folded on the forehead, with bent body, lying on the right side (of the mother) if it is male, on the left if female, in the middle if impotent. When the mother sleeps it sleeps, when she rises it rises, for the foetus is not independent. Since the conception the feeding and animation of the foetus are maintained by the vessels conducting the chyle *(rasa)* and pervading the whole body of the mother, when one part of the diet of the woman which is turned into chyle feeds her own body, another part forms the milk in her breasts and a third part feeds the foetus and makes it grow. When the body of the foetus is developed, a vessel is connected to its navel, the placenta *(aparā)* is connected to the vessel and to it the heart of the mother. Then the essence of the food flows from the heart of the mother to the placenta through the veins, from there to the navel (of the foetus) and then to the internal body of the foetus after being digested by the (digestive) fire of the same and it nourishes the elements and component parts of the foetus (Car 4.6. 23; AS 2.2.203 ff.; Su 3.3.31; 3.5.42; Bhoja in Ḍallaṇa l. c.). The foetus excretes neither wind nor urine nor faeces, because it does not take for itself any food except the chyle which is free from impurity and because it has no wind inside the body. It does not cry, because its mouth is stopped by placenta, the throat is filled with phlegm and the passage of the wind is blocked. Breathing, movements and sleep coincide with the corresponding actions of the mother (Su 3.2. 53–55; AS 2.2.204).

From the mother are created the blood, flesh, fat, marrow, navel, heart, liver, spleen, kidneys, bladder, rectum, intestines, anus, lungs, retina, peritonium, omentum, i. e. the soft parts of the body. From the father are created the hair, beard, nails, teeth, bones, vessels, sinews, nerves, sperm, i. e. the hard parts of the body. From the soul

which is united with the sperm and menstrual blood while entering the uterus, are created the life, the knowledge of self (*ātman*), mind, senses, pleasure and pain, love and hatred, intelligence and recollection and other mental powers (Car 4.3.12–14; Su 3.3.33; AS 2.5.220; AHr 2.3.4–8). According to Suśruta liver and spleen are generated from the blood when it is boiled by the bodily heat which is kindled by the wind in the intestines (*samāna*). The lungs are created from the froth and the stomach *(uṇḍuka)* from the secretion of blood. From the essence (*prasāda*) of blood and fat the kidneys are created and from the essence of flesh, blood, phlegm and fat the testicles are created. According to AS intestines are created from the essence of blood and flesh. According to Su an essence of blood and phlegm is boiled by the bile when the wind is also present and by this boiling in the uterus are created the intestines, the anus and the bladder. The wind accompanied by heat opens canals for itself and penetrates into the flesh and produces muscles all over; it also forms the veins and sinews after it has received fatty stuff from the fat. The heart consists of an essence of phlegm and blood. It resembles a blooming lotus-cup which is opened when man is awakened and closes when he sleeps. It is especially the seat of intellectual activity (Su 3. 4. 25–31; AS 2.5.222 f.).

§ 42. **Obstetrics and Care of the Confined Woman :—** At the birth the foetus is moved by the birth-peristalsis and comes out of the vagina with head below, then the placenta comes out when it is separated from the heart of the mother (Car 4.6.24; Su 3.5.45; AS 2.2.204). The rules for the treatment of labour are laid down in the chapter prescribing the rules for the construction of the " house for the confined woman " (*sūtikāgṛha, sūtikāgāra*). The Sūtikāgṛha is a room 8 *hasta* (*hasta* = 1½ foot) long and 4 *hasta* broad. It should be constructed from different kinds of wood according to the caste of the woman. The bed of the woman should consist of the same wood, the walls should be whitewashed, the door should be on the east or on the south side, the household furniture should be ample and conveniently distributed (Su 3.10.5; AS 2.3.209; AHr 2.1.73 f.). Fire, water, a mortar, privy, a bath-room and a kitchen (or cooking implements) should also be there. Butter, oil, honey, different kinds of salts and medicines, sharp iron knife (for operation) etc. as well as many respectable and expert women who have often delivered, and

Brāhmaṇs knowing Atharvaveda should be present there (Car 4.8.33). The fire corresponds to the *sūtikāgni* of the Gṛhyasūtras which particularly serves for the removal of evil spirits[1]. The pregnant woman should be brought in this room[2] in the ninth month or even before the beginning of the same on an auspicious day with gifts to the Brāhmaṇs and to the cows and with other ceremonies. There she should wait for her delivery and should take suitable diet. At the smallest retention of urine or constipation she should use suppository (Car 4.8.33; AS l. c.).

The approach of delivery is known by the following symptoms : relaxation of limbs, fatigue in the eyesight and in the eyes, looseness and feeling of loosening of the bonds of the breasts, sinking of the belly and a feeling of heaviness in the lower abdomen, stinging in the breasts, bladder, hips, sides and back,pain and twitching in the genitals, loss of appetite, expectoration, evacuation and passing of urine and mucas discharge from the vagina. Then begin the birth-pains and discharge of uterine liquid. As soon as the birth-pains begin, an amulet is tied to her (AS, AHr), blessings are given to her, fruits with names of male race are given in her hand, male children are kept around her, she is anointed and bathed with warm water and is given to drink a large quantity of rice-gruel.She should lie on a low and soft bed,with bent thighs and curved back, with the face turned upwards. The bed should be covered with cushion and a red bull-hide (AS). There should be four experienced and courageous women of advanced age and with clean clothes before whom she may not feel shy, who have cut their nails and who cheer her with friendly words. Then fragrant powder should be given her repeatedly to smell; she should be perfumed and anointed with lukewarm oil particularly on the genitals, whereby the coming out of the foetus with head below is expedited. That the turning of the foetus has resulted, is known from the fact that it is loosened from the heart of the woman, comes in the belly and reaches the neck of the bladder, whereby pains become more frequent (Car, AS, AHr). According to Car, AS, AHr she should then be placed on her bed and should try to press out the foetus while one of the women encourages her. Different views are held on the point whether, in case the delivery does not take place even after the pains, she should get up and pound corn in a mortar with a pestle, evidently in order to intensify the pains by these severe movements. Car and AS express

their opinions against it, because the pregnant woman must always avoid severe physical exertions and because she is particularly sensitive at the time of delivery and her life is in danger. Instead of that Car, AS, AHr recommend going around and yawning. The untimely pressure without preceding pains is bad and injures the mother as well as the child, which thereby comes in the world crippled or sickly. The woman should first press gradually, then rather forcibly and at last when the foetus comes out very strongly, until the delivery is effected. While she presses, the women around should gladden her by saying : " born, born a good son ". If the foetus remains stuck (Su, AS, AHr), the vagina should be smoked with the skin of black serpent or with the *piṇḍita* plant, or a root of *hiraṇyapuṣpī* should be tied around her hands and feet, or she should hold certain plants in her hand (Car 4.8.36; Su 3.10.11; AS 2.3; AHr 2.1.83). Similar procedure takes place if the placenta does not come out[1]. Thus a woman should examine the confined woman in order to ascertain if the placenta has come out or not (Car). If it has not come out, one of the women should press her forcibly above the navel with the right hand,should seize her back with the left hand and should shake her thoroughly. Then she should press her on the hips with her heels, should clasp her buttocks and should press them together with all strength. Then she should put into her throat a braid of hair or a finger with hair[2] twisted around. The vomiting effected hereby can also be caused by giving certain vomiting and other substances causing nausea, such as urine.Smoking of the vagina and douches in the same, rubbing the genitals with pungent substances, oil-clysters, smearing the forehead with the milk of wolf, or rubbing the heels and hand-palms with *lāṅgalī* root, eating certain medicines like e. g. a decoction of various plants in which the detached right ear of a living male donkey is dipped,pulling out of the placenta with the hand after oiling the same and cutting the nails, and other remedies are also prescribed (Car 4.8.40; Su 3.10.21; 17; AS 2.3.209–12; AHr 2.1.74–91).

The woman should, according to Suśruta, be anointed with *balā* oil and smeared with a decoction of herbs removing vāta. If any disease (*doṣa)* has still remained in her, she should be given to drink on the same day pepper (*pippalī*), pepper-root and other pungent stuffs powdered and mixed with sugar-water. This should be pursued for 2 or 3 days until the spoilt blood is removed. When the blood is

purified, she should be given to drink for three days oil- or milk-pap prepared with *vidārigandha*. Then she should be given, according to the condition of her vitality and digestive power, rice with deer-sauce prepared with corn etc. When she has taken this diet for one and a half month, the restrictions in relation to her diet and mode of living are stopped, and she is no more considered as *sūtikā*. According to some, this is so when menses appear again (Su 3.10.16). Her body is also anointed and is covered with long piece of cloth in order that vāta may not enter her body and harm it. Anointing of the body, smearing, baths etc. are in general recommended to the woman along with strength-giving food and drink. Such care of the woman is necessary, lest difficult or even incurable diseases may threaten her (Car 4.8.47 f.; AS 2.3.212 f.; AHr 2.1.94–100 f.).

(1) Hillebrandt, *Ritualliteratur*, § 13. Cf. Oldenberg, *Die Religion des Veda*, pp. 337 f. (2) So even at present, e. g. Bose, *The Hindoos as they are*, 22. (3) Cf. Hillebrandt, l. c. § 13. (4) So even at present, cf. Chevers, *A Manual of Medical Jurisprudence for India*, 769.

§ 43. **Care of the New-born :—** Immediately after the birth the child should be cleansed with egg-kernel and rock-salt, and butter should be given in its mouth. Hereafter proceed the acts which correspond to the "life-giving" ceremonies *(āyuṣyāṇi)* of the Gṛhya sūtras[1] and which aim at the enlivening of the child fatigued by the act of birth and sprawling helplessly. Two stones are rubbed on the ears of the new-born, the ear-roots are moisted with cold or warm water, *Balā* oil is applied to the child, a piece of cloth moisted with butter is placed on its head, a saying expressing the desire that it may live for a hundred years is uttered in its right ear (Car 4.8.46; Su 3.10.12; AS 6.1.170; AHr 6.1.1–4). According to Car (l. c. 40) the cleansing of the child takes place only after the life-giving ceremony, and the giving of salt and butter serves as an emetic *(pracchardana)*. When the child is awakened, the umbilical cord should be tied eight (four–AS, AHr) fingers away from the navel with a linen thread and it should be cut with a sharp knife. Then the end of the thread should be hung loose around the neck of the child (in order to obstruct the flow–Ḍallaṇa) (Car 4.8.44; Su; AS l. c.; AHr 6.1.5). If the navel of the child is painful, it should be rubbed and a powder should be sprinkled on it. If the umbilical cord is not properly treated, painful crookedness of the body, gasping for breath and other diseases

(Tetanus ? see below) are caused. The child is, therefore, to be treated with ointments that are mild and appeasing vāta and pitta, with smearings,sprinklings and butter. Hereafter the ceremony of *jātakarman*[1] is to be performed. Honey and butter are to be given to the child to eat according to direction, then in the same manner the right breast of the mother is to be given first to drink, then a pitcher is to be placed near its head with recitation of mantras. This is according to Car 4.8.46. According to Su 3.10.13–15 the child should be aroused with cold water, then the *jātakarman* ceremony should be performed and then it should be made to lick mixture of honey, butter, (root of) *anantā*, *brāhmī*–juice and powdered gold which should be put in its mouth with the small finger. Hereafter *Balā* oil should be applied to it, and it should be washed with a decoction of trees yielding milk, or with fragrant water or with water made hot with heated gold or silver, or with a lukewarm decoction. Since the milk comes in the woman only after three or four days, the child is given to drink honey and butter mixed with *anantā* consecrated with sayings (*mantras*), three times on the first day, butter prepared with *lakṣmaṇā* on the second and third day, then (on the fourth day) mother's milk with honey and butter as much as can remain on the palm of the hand, two times a day. Thereafter, according to AS, AHr, the child should be allowed to drink as much milk as it desires. From AS 6.1.170 f. and AHr 6.1.6 f. it is also to be gathered that after the washing or bathing of the child, its lips, tongue and throat should be wiped off with the small finger of the right hand covered with a piece of cotton cloth, whereupon the feeding of the child with a small quantity (*hareṇumātra*) of honey and butter mixed with a paste of certain plants follows, in order to give the child intelligence, long life and strength, corresponding the *medhājanana* of the Gṛhya sūtras[3]. The clothes and the bed of the child should be soft, light, clean and fragrant (Car 4.8.46; AS 6.1; AHr 6.1.25).

A series of further performances is aimed at the protection of the child and the woman from demons[4]. Thus the physician should spread over the room with twigs, the child should also be fanned with the same, mustard and other corns should be spread in the room and the room should also be filled with their smoke, a fire-offering should be made two times a day, a pestle should be placed before the door prior to the naming ceremony (see below), a bundle of certain twigs and

of plants which are called *rakṣoghna* ('demon-killing') should be tied on the upper threshold of the door and also on the body of the child, the (abovementioned) fire should be maintained, a Brāhmaṇ should perform atonements and say prayers for ten days, the women as well as friends and relatives should keep a watch for ten or twelve days and the room should be enlivened with songs and music and provided with food, drink etc. and cheerful persons (Car 4.8.49; AS l. c.; Su 3.10. 29). These customs are to be observed especially on the sixth night (AHr 6.1.21; AS 172). This corresponds to the still existing cult of *Ṣaṣṭhī*, "the Goddess of the sixth" which is attributable to the Tetanus frequently occuring on this day or a little later[5] in consequence of the defective separation of the umbilical cord.

On the tenth day or on the day after the 10th night or on the 12th day the woman is allowed to rise from her bed and the ceremony of naming (*nāmakaraṇa*) takes place which is described in a manner similar to that in the Gṛhya sūtras[6]. Along with the popular name, the child receives another name which is derived from the constellation at the time of its birth. At times it receives only the latter (Car 4.8. 49; Su 3.10.24; AS 6.1.172; AHr 6.1.22 f.). In the fourth month the child is nicely adorned and is taken out of the room in order to worship the gods, corresponding "the first going out" (*niṣkramaṇa, niṣkramaṇikā*) of the Smṛtis and Gṛhya sūtras[7]. In the fifth month the child is placed on the floor with the utterance of a saying in which the earth is called upon to protect it like a mother. In the sixth month the first feeding of the child (*annaprāśana*) is observed as is laid down in the Gṛhya sūtras[8]. With this ceremony begins the weaning off of the child. In the 6th to 8th month, a physician should make a hole in its ears, in the case of a boy in the right first, and in the case of the girl the left, whereupon jewels fixed in a golden ring are hung on the ears. When the child has got teeth, it should gradually be weaned off, and milk (of goat and other animals), light substantial food and sweets etc. should be given to it (AS 6.1.173–5; AHr 6.1.28–40). Su 3.10.52 (cf. AS l. c. 175) also speaks of the instruction to be imparted to the male children according to their status as soon as they have reached the requisite age and also speaks of their marriage. See § 39.

The toys of the child should be coloured, making noise and entertaining. They should not be heavy, should not have a sharp edge,

should not be penetrable in the mouth and should not be dangerous to his life or frightening him (Car 4.8.62). Precautions should be taken not to frighten a child, or not to threaten it with demons even though it is disobedient, even though it cries or does not wish to eat, lest it might be taken possession of by the *graha*– the frightful disease-demon of the child (cf. § 50). One should also not wake the child suddenly or handle it violently, as such a course may disturb the tridosas of the body and stop the natural secretions. One should seek to cheer it in hundredfold ways. One should not always allow it to lie on the ground, lest it might get crookedness of the back. One should guard it against wind, Sun, lightning, rain, shadow of a house, evil plants, demons and other dangers, and should tie an amulet on it. Children's diseases (cf. § 50) should be warded off with mild remedies. Purgatives are to be completely avoided except in difficult cases (Car 4.8.63–64; Su 3.10.41–45; AS l. c. 173–6; AHr 6.1.42–50). Car 4.8.58 (cf. AS 173) also speaks of the construction of a special room for the child (*kumārāgāra*) by an expert architect. It should be protected from wind, but there should be free ventilation on one side. It should be well endowed with furniture, water, cooking place, should be clean, free from insects, bright and nice etc.

(1) Hillebrandt l. c. § 14. (2) According to MN 2.29 and the Grhya sutras the Jatakarman, on the contrary, takes place before the cutting of the placenta. See Speijer, *jatakarma*, 47, Hillebrandt l. c. According to Ward in Chevers l. c. 769 even at present the ceremonies taking place after birth, yet before the cutting of placenta use to continue for two hours. (3) Hillebrandt l. c. (4) Cf. Hillebrandt l.c. (5) Crooke, *Folklore of Northern India* (London 1896) 1, 131. (6) Hillebrandt §§ 16. 17. (7) l. c. § 19. (8) l. c. § 20.

§ 44. **The Wet-nurse :—** The mother's milk is recommended as the best food for promoting growth and nourishment. If it is not healthy, a wet-nurse should be engaged (AHr 6.1.15). The wet-nurse (*dhātri*) should be of the same status in society as that of the child, of middle stature, neither too thin nor too fat, healthy, of good behaviour, free from blameable inclinations, not greedy, not crippled or crooked or of frightful appearance, clean, loving, belonging to good family, not of low caste or of inferior occupation, reliable, of elegant dark complexion, chaste, one whose child is living and is of male race and healthy, and who has plentiful and healthy milk. Her

breasts should not be too raised, or should not hang loose and low, should not be too thin or too full, possessing good nipples from which the child can suck without trouble. The effect of raised breasts is that the mouth of the child opens wide (which may cause dislocation of jaw); the loose breasts would cover its nose and mouth, so that it may suffocate. Signs of healthy milk are that it mixes with water when put in it, is cold, clean, thin, (white) as a shell, does not produce bubbles or threads (in water), does not float on the surface or does not sink. By such milk the child grows and nourishes and becomes healthy and strong (Car 4.8.51 f.; Su 3.10.25; 31; AS 6.1.172). Bad milk floats on water, is dark-red, dry, frothy, light, not satisfying the child, causing diseases of vāta, having sour aftertaste, constipating etc., if it is affected by vāta. It produces yellow stripes in water, is black, blue or copper-red, causing diseases of pitta, very warm, bitter, sour and pungent in aftertaste etc., if it is affected by pitta. It sinks in water, is very white, sweet, of saltish aftertaste, sticky, causing diseases of kapha etc., if it is affected by kapha (Car 4.8.54; Su 3.10.31 f.; AS 6.2.177; AHr 6.2.2–4). Defective feeding of the mother or of the nurse is considered as the chief cause of such derangement of the doṣas (Su 3.10.32; AS l. c.). Milk is the sweet extract of the digested food which is gathered in the breasts from the whole body (Su 2.10.16). The mother's milk can entirely dry up by vehement passions like anger, grief, sensual love and also by unhealthy food and drink. In order to increase the milk the woman should eat barley, wheat, rice, flesh of swampy animals, sour gruel, garlic, fish, vegetables, spirituous drinks with the exception of rum, milk, flesh-broth, and the like. Evasion of exercise and cheering are also recommended (Su 3.10.30; AS 6.1.172; Car 4.8.51).

Bad milk causes various diseases which an expert physician knows by symptoms. If the child has got pain in any part of body, it always touches the same again and again, and cries if others touch it. In headache it closes the eyes and cannot hold the head straight. In heart-disease it bites the tongue and lips, breathes with difficulty, closes the fists and looks upwards. If the bowels are defective, there is retention of urine and constipation, vomiting, flatulence, tremor in body, the child becomes pale, bites mother's breast, its back becomes crippled and its belly swells. In diseases of bladder the urine is retained with pain and there is thirst, uneasiness, rolling of eyes and senseless-

ness. If the whole body is suffering, the child cries unnaturally (Su 3.10.33–36; AS 6.2.277; AHr 6.2.5–8). Cough, difficulty in breathing, fever and vomiting are caused if the suckling baby drinks excessively thick milk from too full a breast from which no milk comes out. Therefore, such milk should be avoided (Su 3.10.29; AS 6. 1.172). The bad milk of the mother or the nurse should be "purified" by different medicines. An emetic and purgative are particularly recommended; the patient must also take a specific diet (Car 4.8.49f.). Medicine is given to the mother and the child if the child is fed only with mother's milk or with mother's milk and rice. It is given to the child if it is fed only with rice. The child takes the medicine mixed with butter or sugar, or it is applied to the mother's breast as a paste which the child sucks, or the lip of the child (*kṣīrapa*) is smeared with it. In fever the child should not be allowed to the breast in order to pacify its thirst. Purgatives, enemeta, and vomitings are also inadmissible except in danger of life. In certain cases nourishing and perspiring remedies, anointings, cold baths etc. are prescribed. Thus a painful swelling of the navel, denoted as *tuṇḍī* should be treated with hot poultice, the inflammation of the anus with ointment and medicines of *rasāñjana* (Su 3.10.37–44; AS 6.2.177; AHr 6.2.9–19). Particularly bad is the disease *kṣīrālasaka* (" milk-tympany ") : the child gets diarrhœa which is watery, bad smelling and frothy, passes white-yellow and sticky urine, suffers from fever, nausea, thirst, vomiting, flatulence in stomach etc. The treatment chiefly consists of emetic to be given to the wet-nurse or mother as well as to the child (AS 6.2.128f.; AHr 6.2.20–24).

The first application of the child to the breast takes place in a ceremonial manner. The mother or nurse having sweet, plenty and pure milk should bathe on an auspicious day of the lunar month and apply toilets to herself, should wear a white clean garment, should carry with her certain tonic herbs, should turn her face towards the east, should let the child drink the previously washed right breast with its face turned towards the north, after some milk from the same is let out. At that time a saying is to be uttered which expresses the desire that the child may obtain a long life by drinking the milk contained in both the breasts, as the gods obtained the same by the use of ambrosia (Car 4.8.57; Su 3.10.25–27; AS 6.1.172). According to AHr 6.1.15 f. the child should have not only one, but two nurses.

In case the breast-milk is not available, the child should be given goat's milk or cow-milk, not much at a time, according to AS, with the addition of certain roots. After six months the rice-diet commences. See above § 43 (Su 3.10.48 f.; AS 6.1.173)

§ 45. **Abortion** :— Premature births are brought about by food or drink that is too heavy, warm or pungent, particularly by flesh and intoxicating drinks, insufficient feeding, fasts, indigestion, unaccustomed physical exercise, sexual intercourse, violent movements, riding in a fast going carriage, running, stumbling, tumbling, falling in a grove or a well, sitting in an uncomfortable posture, wandering by night, suppression of natural excretions, anger, grief, anxiety, fright, sudden hearing or looking, diarrhoea, emetic and purgative, abortive things and other injuries (Car 4.4.18; 4.8.22; Su 2.8.3; AS 2.3.106; AHr 2.1.44–47; 2.2.22). The foetus comes out either as an unripe fruit, or withered or expires in the womb (AHr l. c.). As the fruit which is devoured by worms or is shaken by the wind falls down before time, so the foetus comes before time if it is loosened from the connection (with the mother) in consequence of some injuries; in a normal birth the foetus is loosened from the placenta at the expiry of its time like a ripe fruit which is loosened from its stalk. Abortion in the beginning of pregnancy is called *garbhavicyuti*, *garbhavidrava*. If the pregnant woman menstruates on account of defective retention in the first two or three months, it is clear that the foetus will not remain, for in this period it does not become firm (Car 4.8.24; Su 2.8.7–9; AS 2.4.214; MN 456). In the disease of female genitals which carries the name *putraghnī* ("killing the son " cf. § 49), the flow of blood (*raktasaṁsrāva*) is considered as the cause of death of the foetus (Su 6.38.13). According to Su and MN such early births extend to the fourth month. On the other hand, an abortion in the fifth or sixth month when the body of the foetus has already become firm, is denoted as *garbhapāta* (Su 4.8.10; MN 418). Others take the period of *garbhapāta* to begin with the fourth month (Car l.c.; Bhoja in citations).The phenomenon of abortion according to Su, AS is that the loosened foetus comes out of the womb and deranges the intestines. The derangement of nervous energy in the lower abdomen causes violent pains in the neck of the bladder, abdomen, sides and the vagina; it causes constipation and retention of urine and kills the foetus while it is still young and drives it out (Su 2.8.3; AS 2.4.216).

If, on the contrary, the foetus is developed and dead, the womb looks stretched, tight and cold as if there were a stone inside. The pain is very violent, the foetus does not move, there appear no birth-contractions and there is no excretion from the vagina; on the contrary there is giddiness, thirst, difficult breathing and exhaustion, the eyes are sunk, the woman feels herself very uncomfortable, wavers around, gets convulsions, is partly unconscious and fatigued, cries, cannot sleep by day and night on account of difficult breathing, snorts, feels pain in taking breath and becomes cachectic. By these signs the death of the foetus is known (Car 4.8.26; AS 2.4.216; AHr 2.2.22–24). Su 2.8.9 mentions as symptoms the cessation of child's movements and birth-throes, a blackish pale colour of the face, stinking breath and pricking pain.

Similar symptoms appear if the foetus does not grow on account of the disease of the placenta and deficient feeding caused thereby. In this case it is called *upaviṣṭaka* when it neither grows nor reduces, *upaśuṣkaka* or *nāgodara* when it is reduced and the lower part of the abdomen of the mother becomes smaller, and *līna* when it does not throb and does not move (AS 2.4.184 f.; AHr 2.2.14–18; Car 4. 8.26–27). Here (i.e. in the case of the *līna* foetus) the case apparently seems to be that of abdomenal pregnancy. When people say that the child has been carried away by *Naigameṣa*, the case seems to have been that of a false pregnancy (Su 3.10.57; AS 2.4.216; Bhāv 2.4.184).

§ 46. **Treatment of Abortion :—** The treatment of abortion, setting aside the *garbhasthāpana* already mentioned in § 40, varies according to the symptoms and the month of pregnancy. Su 3.10. 58 ff. prescribes for every single month of pregnancy from the first to the tenth, particular roots and herbs which should be given to the woman with milk and butter in order to feed the foetus and to appease the pains of the woman. Cf. Car 4.8.27 ff. According to Su 3.10.57 cold baths etc. are to be given if the foetus threatens to come out by reasons previously mentioned and if there is pain in the genitals, hips, ridges and bladder, and if there is bleeding. If the foetus is moving repeatedly, the woman should be given to drink milk prepared with lotus-fibres and other (plants) in order to hold the foetus fast. If the foetus is coming out and has left its place while at the same time there is heat, pain in the sides and the back, bleeding, constipation and unrest in the womb, oily and cold remedies should be applied.

In severe pains she should be given to drink a mixture of milk, sugar and honey with various medicines, in retention of urine milk with darbha grass etc., in constipation milk with *sauvarcala* salt, garlic etc., in severe bleeding certain medicines with honey etc. If immediate remedy is administered in this way, the pains get reduced and the foetus grows. If the foetus has come out, she should be given thin gruel which is prepared with substances promoting digestion for as many days as the months have passed since the beginning of pregnancy. According to AS 2.4.214; AHr 2.2.6 f. one should only watch if the woman is in the third month of pregnancy, as in this period the foetus comes out easily; in this case she should be given dry and cold substances. In abortion the woman should take spirituous drinks in large quantity and then rice-gruel. Rice-gruel with different additions should be given to her if she dislikes spirituous drinks.

If the death of the foetus is known by the symptoms mentioned in § 45, three procedures are possible according to Car 4.8.30 : The same methods as those for the extraction of placenta should be applied (cf. § 42), or a procedure with incantations etc. according to the scriptures of the Atharvaveda, or the foetus should be extracted by a skilful surgeon (*śalyahartṛ*). After the removal of the foetus, the woman should be given to drink a large quantity of any spirituous drink in order to cleanse the uterus thereby, to make her forget her pains and to exhilerate her. Then she should be given rice-gruel prepared with fat and other substantial and nutrient articles of food; in case the foetus was undeveloped, also enemeta etc. If the foetus was developed, she should be given nutrient diet on the same day. In AS 2.4.217 the three procedures are especially referred to in the case of *mūḍhagarbha* (cf. § 47) and Su 4.15 chiefly deals with the operative removal of a *mūḍhagarbha*; he even advises the quickest removal of a dead foetus in general, as it would otherwise kill the mother quickly. The incision is to be taken with a rounded surgical knife (*maṇḍalāgra*), as an edged lancet (*vṛddhipattra*) might wound the mother. If the placenta has not come out, the surgeon should pull it out in the manner already described, or should pull it out with the hand, while he presses the woman on both her sides after applying oil to the genitals and shake her severely. After the delivery he should sprinkle lukewarm water on her, anoint her and pour oil in the vagina whereby it becomes soft and the pain is reduced. She should be given

to drink a mixture of oil with various powders and in the evening she should be given spirituous drinks. When the woman is cured and four months have passed after her delivery, she may give up this diet (Su 4.15.13–28). According to AHr 2.2.24 ff. if the symptoms of the death of the foetus are present, the woman should be sprinkled with lukewarm water, her vagina should be smeared with pounded sugar, fermenting stuff and salt, then it should be filled with butter and resin and verses related to the coming out of the foetus should be recited.

For *upariṣṭaka* and *nāgodara* Car 4.8.27–28 prescribes butter preparations; for *nāgodara* also milk, eggs and things which cause the growth of the foetus, and frequent riding. For *līna* he recommends taking gruels of the flesh of the falken fish, *Bos gavaeus*, partridge, cock or peacock with butter etc., and anointing the body with lukewarm oil. Similar prescriptions are given by AS 2.4.215 ff., and AHr 2.2.17–20. The egg preparations, according to Aruṇadatta, should be so prepared that they may not cause nausea while eating. The riding should serve for shaking the body. According to Su 3.10. 57 the shaking of the body can be effected also by thrashing with the pestle in a mortar full of corn (cf. § 42) or by inconvenient sitting in the case of the foetus remaining in the womb over and above the time. In the case of a foetus vanishing by demonical influence the procedure as in *līna* and *nāgodara* is to be followed.

§ 47. **Obstructed Delivery**[1] :— The designation of abnormal position of the foetus as *mūḍhagarbha*—"the foetus gone astray (entangled) or coming by improper direction " is based on the theory that the retroperistaltic movements of the wind are considered as the cause of the same. After the enumeration of the symptoms of death of the foetus in the womb mentioned in § 45, it is said in AS 2.4.217 : a foetus pressed and entangled in various places by the retroperistaltic movements of the wind entering the *yoni* somehow or the other, not in the proper manner, is called the *mūḍhagarbha*. The positions are innumerable, as the pressure due to the retroperistaltic movements of the wind is of manifold nature. Yet there are three chief directions : upward direction, downward direction and oblique direction. Further there are eight positions which will be described later. AHr 2.2.36 lays down in brief the variety of the positions caused by the

retroperistaltic movements of the wind. The physician has, therefore, to proceed according to the positions. The expressions *mūḍhagarbha* and *mṛtagarbha* are many a time wrongly used. This is due mostly to the unfortunate result of the obstructed delivery. Caraka mentions only the *mṛtagarbha* and takes no cognisance of the abnormal positions. The commentators explain *mūḍha* also by *ruddhagati*– " whose advance is hindered ".

Su 2.8.5 gives the following description of the eight positions: [1] the child descends with both the legs (*sakthi*, literally upper thighs) in the vagina. [2] Only with one leg while the other is bent in. [3] With bent legs and trunk, with back side, in circular position. [4] It covers the vagina with the breast (with belly) or sides or the back. [5] The head is bent towards the sides, one arm is stretched forward. [6] The head is sunk, while both the arms are stretched forward. [7] The middle part of the body is bent, while the hands, feet and the head are stretched forward. [8] One leg arrives in the vagina, the other towards the arms. MN 419 offers another version : [1] Blocking the entrance with the head. [2] With the belly. [3] Hump-backed through the turning of the body. [4] With one arm. [5] With both the arms. [6] In circular position. [7] The face downwards. [8] Tilted towards the sides. Another old classification distinguishes only four cases with characteristic names : [1] *kīla* (wedge) when the child blocks the vagina like a wedge with arms, head and feet directed above. [2] *pratikhura*, when the hands, feet and head come out and the trunk remains stuck. [3] *bījaka*, when the child comes out with the head and one arm. [4] *parigha* ("bolt") when it lies at the opening like a bolt. Su 2.8.4 records this classification, but expresses his disapproval for it. It is found also in MN 419 and in Bhoja (according to citations); the latter defines *pratikhura* in rather a different way, viz. as a foetus coming out downwards, crooked or by side.

Along with the eight abnormal positions Su 4.15.4 mentions three obstructions (*saṅga*), viz. the natural deformity of the head, of the shoulders and of the buttocks[1]. In relation to the obstruction in the case of a living foetus which he advises the woman to push out (by pressure), AS 2.4.217 plainly says : " There are three kinds of obstructions, viz. the natural deformity of the head, of the shoulder

and of the buttocks." Vr 869 speaks of the upper coccyx (*trika*) instead of buttocks and appears to attribute the natural deformity to the nature of the wind in the body of the woman (*vātagatisvabhāvāt*). Su l. c. also has in view the living foetus with regard to the above conditions and also advises the mother to try her best to bring it out.

If a woman gives birth to a son after a barrenness of six years, the son will not live long (Su 3.13.66).

(1) Cf. the remarks of Kielhorn and Oldenberg in Fasbender l. c.
(2) The conception based on this reference by Haser and other scholars, that the ancient Indian midwifery has taken the close pelvis of the mother as an obstruction to birth, is refuted by Fasbender, l. c., and rests only on a wrong translation by Vullers, and also by Wise. The term *saṅga* is always used only in connection with the stagnation of a part of body of the child at the birth, and therefore cannot be taken to mean the hinder part or pelvis of the mother, as is also shown by Dallana.

§ 48. **Treatment of Obstructed Delivery :—** First of all the case of living foetus is taken into consideration. Thus Bhāv 2.4.189 says : " If the foetus is living, but has not properly descended (*mūḍha*), she (the midwife) should pull it out forcibly with her hand anointed with ghee which is introduced into the vagina ". According to Su 4. 15.5–8 suitable mantras in which a desire for an easy delivery is expressed, are to be recited in an obstructed delivery and medicines are also to be given. Hārita 728 ff; 370 ff. recommends smearing of the abdomen with a paste, taking milk that is seven times consecrated, and holding a diagram with certain letters. Similarly Vr 872. Caution is generally given before the dismemberment of the perhaps yet living foetus, lest it might kill the mother, according to AS by its violent movements,just on account of the hypothetical close connection between the mother and the child (Su 4.15.10; AS 2.4; AHr 2.2.37; Vr 869).

There is a direction for the Caeserean section on a dead mother. If at the time of delivery the woman dies (in the 9th month or later–Ḍallaṇa) like a goat (i. e. suddenly by throttling–Ḍallaṇa) and her abdomen is palpitating, the surgeon should cut it forth and extract out the foetus. The reading in AS 2.4.52 (*bastidvāre* for *bastamāram*) does not mention sudden death of the mother, but only

mentions throbbing of the abdomen over the urethral passage as an indication for the operation. Vr 868, on the contrary, definitely mentions death (*abhighātāt*). An expert surgeon can obtain wealth and fame by such operation.

According to Su 4.15.9 (cf. AS 2.4.217 ff.; AHr 2.2.26–28; Vr 869) the woman should lie on the back with legs bent in the case of still birth (and obstructed delivery–Ḍallana), the hips raised by a cloth laid beneath; the surgeon should pull out the foetus with a greased hand. At that time he should extract out the foetus that comes out with both the legs stretched, if it is coming out with one leg he should pull out the other, in the case of one coming in backside position he should press the backside part above, stretch both the legs and thus pull it out. In an oblique presentation he should press up the lower half and bring the above half in the right direction towards the vagina and take out. In the case of propensity of the head towards the sides, he should push back the shoulders and draw out the head. In prolapse of both the arms he should likewise press the shoulders above and draw out the head. Of these positions (cf. § 47) the last two are considered as incurable;a foetus in these positions is called *viṣkambha* ('bolt') and must be dismembered with a knife (*śastra*). The surgeon should cheer up the woman and should cut the head of the foetus with a rounded or finger-formed knife (*maṇḍalāgra, aṅguliśastra*), and should take out the skull-bones, then should take hold of (the trunk) on the chest or arm-pits with a hook and pull out, or (should fix the hook) in the eye-holes or cheeks without dismembering the head. In prolapse of the shoulder he should extract the foetus out after cutting the arm in the shoulder. If the body of the foetus is swollen by wind like a full-blown tube, he should open it in order to take out the intestines and then draw it out. In back position he should dismember the orbicular bones in the anus. In general, the surgeon should cut out every part of the body that remains stuck, and extract it out and should try his best to save the mother (Su 4.15.11; AS 2.4; AHr 2.2.29 ff.)

All such operations are very dangerous because one has to operate by mere perception of touch and only with one hand amidst organs like the vagina, liver, spleen, uterus and other sensitive organs and then has to perform manipulations of extracting, pressing, cutting and other things. The surgeon must, therefore, secure the permission

of the ruler (*adhipati, īśvara*) and must take great pains for the operation. According to Bhāv 2.4.189 the treatment is, on the contrary, to be entrusted to women midwives who have gained fame by many successful deliveries even under difficult circumstances. A clever and fearless woman experienced in surgery should insert the knife in the vagina if the foetus is dead.

Excepting the 7th and 8th position, the *mūḍhagarbha* and the woman affected with it are considered as incurable if there are certain complications, e. g. constriction of the vagina, prolapse of the uterus, inflammation of the peritonium (? *makkalla*), difficult breathing or cough, giddiness, nervousness, convulsions, cold in the body etc. (AHr 2.2.38; Su 2.8.6; MN 420).

(1) Cf. Fasbender l. c. 53-8.

§ 49. **Women's Diseases and their Treatment :—** The diseases of the confined woman are grouped under the name *sūtikāroga*. The symptoms are : pains in the limbs, fever, shivering, thirst, a feeling of heaviness in the limbs, swelling, colic, diarrhoea or the appearances of ailings emanating from kapha or vāta such as fever and diarrhoea, ulcer, loss of strength, nausea and so on. The puerperal fever is also particularly mentioned. The remedies specially recommended are decoctions of different plants and roots, hot treatment, anointing, baths etc. (MN 411 f.; Vr 876 ff.; Bhāv 2.4.192-4; cf. Su 3.10.19 f.; Kauśika sūtra 28.15). In *makkalla* the blood retained by vāta in the genitals of the woman causes swelling below the navel, in the sides, in the bladder or in the neck of the bladder, causes pain in the navel, in the bladder, and in the belly, sensation in the entire uterus which is as if pierced with a needle, and retention of urine. Peritonitis or Perimetritis puerperalis is perhaps meant by this. The remedy consists of various decoctions mixed with ghee, salt, lukewarm water etc. (Su. 3.10.22; AS 2.3.211 ff.; Bhāv 2.4.191). If there is a prolapsis of the uterus, a skilled woman midwife should smear it with the blood of some animal and set it in its place. When it is set firm, she should warm it with a decoction of oil and various plants and replenish and should say to it : " Blessed one, go to thy place " (AS 2.3.212).

As diseases of the pregnant woman (*gurviṇīroga*) Bhāv 2.4.179 mentions movements of the foetus (beginning of abortion, cf. § 45),

bleeding (*pradara*), pain in the body, fever, chronic fever, intestinal catarrh (*grahaṇī*) and recommends for it various decoctions. Of these diseased conditions, the bleeding or menorrhagia, dysmenorrhoea (*pradara, asṛgdara, raktayoni*, cf. AS 2.1.196) is frequently mentioned and is placed mostly at the top in diseases of women (*strīroga*). According to Car 6.30.196–209 the cause of *pradara* is the excessive use of food which is saltish, sour, heavy, pungent, hot, oily, as well as flesh, fish, spirituous drinks etc. The vāta deranged hereby causes excessive collection of blood in the veins of the uterus which carry the menstrual blood in the same. The treatment chiefly consists of giving various decoctions and other medicines. *Udāvarta–vibandha* or *udāvarta* is considered as a dangerous disease of the pregnant woman, a kind of obstinate costiveness, in which all excretions are retained (Car 4.8.28; AS 2.4.216; AHr 2.2.21 f.).

Of the female sexual diseases (*yoniroga, yonivyāpad*), twenty kinds are generally distinguished, with many differences in the particulars (Car 6.30.1–39; Su 6.38; AS 6.38.321 f.; 39.324–29; AHr 6.33.27 ff.; 34.22 ff.; MN 413 ff.; Bhāv 2.4.172–4; Vang 848 ff.; Vr 65). The causes of these diseases are : defective behaviour of the woman in connection with diet and manners of life, a bad bed,corrupted menstrual blood, bad sperm, excessive sexual intercourse particularly if the penis of the husband is too large, the use of *apadravya* (remedy for enlarging the penis at the time of cohabitation[1]) and also destiny. The diseased conditions of female genitals partly are : the vagina is abnormally narrow or broad by nature or by disease (*sūcīvaktrā, mahāyoni*) and is not agreeably excited by cohabitation (*atyānandā*), or is violated by sexual intercourse with an especially fat husband or before the attainment of maturity (*aṇḍinī, phalinī, prākcaraṇā*), or painful insufficient menstruation with frothy blood (*udāvartā, udāvṛttā*), excessive flow of hot blood (*lohitakṣayā, rudhirakṣarā*), flowing of corrupted blood which leads to the death of the child or to abortion (*jātaghnī, putraghnī*, customary abortion according to Dutt), tendency for abortion or prolapse which renders the delivery more difficult (*sraṁsinī, prasraṁsinī*), painful dryness of the vagina connected with costiveness and retention of urine (*śuṣkā*), the formation of a puffy growth in the vagina which obstructs the passing of the menstrual blood (*karṇinī*), complete absence of menstruation and barrenness resulted thereby (*vandhyā, ṣaṇḍī*), expulsion of the

penetrated sperm from the uterus together with the menstrual blood after 6–7 days (*vāminī*), or rejection of the same (*acaraṇā*), a very painful crookedness of the entrance of the vagina (*antarmukhī*) etc. The derangements of the three dosas are also responsible for the diseases. The Yonivyāpad result into the fact that the patient does not conceive and falls prey to the various diseases like swelling of the uterus, haemorrhoids, menorrhagia etc. The treatment is directed according to the affected dosas; in vāta nutrient and hot remedies, enemata and other remedies removing the vāta are to be used, in pitta cold baths and in kapha dry and cold medicines. After the application of nutrient and hot remedies the displaced vagina *(yoni)* should be set right, the oblique one should be straightened, the narrow one should be widened, one that has come out should be put in, one that is turned upside down should be turned round, since a displaced *yoni* works like a foreign matter (*śalya*) in female body. In many cases insertion of cotton, pungent stuffs (for cleansing the *yoni*), applying oil etc. are recommended; baths, anointings, shower-bath, substantial food consisting of milk, flesh-broth and the like, various decoctions etc. are further recommended.

The female diseases *kanda* and *somaroga* are met with only in later works (MN 416; Vang 456; Bhāv 2.4.171 f.; 174). *Kanda* (lump, according to Dutt prolapse of womb) is a purulent and bloody tumour of the form of a fruit of the bread fruit tree (i. e. ball-like) in the female genitals. The treatment consists of filling the *yoni* with certain medicines mixed with honey. Causes of the disease are sleep by day, sudden anger, over-exertion, excessive sexual intercourse and and wounds by nail, teeth[1] or otherwise. The disease *somaroga* is a kind of diabetes of women connected with the want of appetite, dry mouth and dry palate, fainting fit etc.

(1) Cf. *kamasutra* 368 f. (2) l. c. 116-135.

V. Internal Diseases And Their Treatment

§ 50. **Children's Diseases**[1] :— Even the Vedic medicine[2] contains information about children's medicine. Thus an incantation against worms in children is found in AV 5.23, cf. Kauśika sūtra 29.22 f. where the lower end of a mortar-pestle (*musala*) is heated on fire and then passed to and fro three times on the *palate* of the child seated on the mother's lap to ward off the worms. The fourteenth chapter of the second medical work of the Bower MS deals exclusively with the treatment of children's diseases (*kumārabhṛtya*) and contains recipes for various kinds of diarrhoea, vomiting, constipation, worms, jaundice, throat-diseases, skin-diseases, being possessed by a male or female demon, fever, cough etc. Jīvaka cited therein (2.1081, cf. Hoernle's remark) as an authority was a contemporary of Buddha and is called the "physician of children" (*komārabhacca*)

The later medical works attribute the usual children's diseases (*bālaroga, bālāmaya*) readily to the influence of the mother's milk. Thus except to the diseases of the suckling baby mentioned in § 43 the harmful effect of the mother's milk is divided also according to the principle of tridosas. Defective milk causes an inflammation of the eyelids (*kukūṇaka*—Suppuration of the membrane of the new-born-Hirschberg) in which the eye itches and frequently drops water and the child rubs the forehead, eye-borders and the nose, cannot look in the Sun, is not able to open the eyelids. If the child drinks milk of a pregnant mother, it suffers from cough, indigestion, vomiting, faintness, weakness, nausea, giddiness, and swelling of intestines. This is called *pārigarbhika* or *paribhava* (MN 425; AS 2.1.173; Vang 889).

A further source of diseases of childhood is the teething. Thus according to AS 6.1.179 f.; AHr 6.2.26 ff., diseases of every kind and on the entire body, particularly fever, headache, thirst, giddiness, dimsightedness, inflammation of the eye, ulcer on the eyelids, vomiting, cough, difficult breathing, diarrhoea and erysipelas are caused thereby. The teeth appear in the eighth month or later if the child is healthy, otherwise at the end of the fourth month. If the children suffer from pains caused by teething in too early an age, they cannot develop normally. The treatment consists of emetics and other

medicines which, however, are to be given in very small dose. A child suffering from teething should not generally be subjected to severe cure, since the ailing appearances disappear by themselves when the teeth appear.

The derangements of dosas are also responsible for the origination of many children's diseases. Thus the disease of the palate *tālukaṇṭaka* is caused by the derangement of kapha in the flesh of the palate (soft palate). The symptoms are an (external) sinking in of the palate region, (internal) sinking of the palate, dislike of mother's breast, pain in swallowing, diarrhoea, thirst, pain in the eyes, throat and the mouth, inability to hold the neck (head) upwards and vomiting. From the derangement of three doṣas is caused a difficult form of erysipelas *(visarpa)*, which is called *mahāpadma*. In general, all diseases of the grown-up, right from fever, particularly the minor diseases (*kṣudraroga*, cf. § 67, MN 426; Vang 889; Bhāv 2.4.208) attack the children also.

Children's diseases are, however, particularly attributed to demoniac influences, perhaps because the innocent childhood is held especially accessible to such influences, and because the suddenness with which the severe illness appears and disappears in children cannot be explained otherwise. The demon *jambha*, who attacks the children, is Vedic and for his aversion the children are taken to mother's breast (AV 7.10. cf. Kauśika sūtra 32.1). *Naigameya*, *Naigameṣa*, partly a deity imparting birth of sons and the exchange of children in the womb, partly a demon making the children ill, is also Vedic. It also appears in ancient sculptures and has the head of a goat (later a ram's head) and is considered as the symbol of lewdness suited to the God of creation'. In the child attacked by *Naigameṣa* there appear flatulence, convulsions of the hands, feet and the mouth, froth in the mouth, thirst, tightening of fists, diarrhoea, hoarseness, discoloration, pains in the body, rattling in the throat, vomiting, cough, hiccup, sleeplessness, biting the lips, crookedness, looking upwards, violent delirium, unconsciousness, smelling of the flesh or fat, fever, tumour in one eye and other symptoms (AHr 6.3.12-14; AS 6.3.188; Su 6.27.16; MN 429). General signs of demoniac possession are the following : The child suddenly shrinks, becomes frightful and cries, it bites itself with teeth and also bites its nurse,

looks upwards, bites its teeth together, groans, yawns, moves eyebrows, teeth and the lips, often spits out froth, becomes lean, does not sleep at night, has swollen eyes, suffers from diarrhoea and hoarseness, smells like flesh and blood, does not eat as before, does not take to breast (MN 427; AHr 6.3.4–8; AS 6.3.187; Bhāv 2.4.197). The symptoms are fever and continuous crying (AS, AHr). Suśruta mentions nine *grahas*— four male and five female *(pūtanā)* which are also mentioned in MN, Vang and Bhāv. Cakradatta 406–12 speaks of twelve female fiends which he calles *mātṛkā* and which attack the child and make it ill from the 1st till the 12th day, month or year. AS 6.3.187; AHr 6.3.1–3 likewise distinguish twelve demons *(graha)*, seven of which are female and the rest male. The *grahas* requested Skanda to procure livelihood for them; he turned to Śiva who advised them to attack the children in the houses in which the gods, fathers and guests, Brāhmaṇs and teachers are not honoured, no sacrifice is offered, broken dishes are used for food and in general the religious customs and rules of purity are not observed. They would thus get good livelihood and honour. Therefore such children whose nurses are dirty, or they themselves are unclean, or who cry at the time of morning and evening prayers, or who are angry, frightful or in a bad mood, or are alone in vacant places, are tormented by the *grahas* in sleep or even in awakened condition by all kinds of spirits. The *grahas* then enter the bodies of the children where they can be perceived only with the eye of science. For they can take any form they like and are invisible for ordinary mortals. The voluntary offences of the nurse or the mother also lead to the attack of the *grahas* (AS l. c.; Su 6.37; 6.27.6). For driving out the *grahas* medicines, baths, fumigation and the like and special sacrifices connected with the invocations of individual *grahas* are recommended besides anointing. Thus an oblation is offered to *Naigameṣa* with an invocation which calls upon " the famous god who has the sight of a goat, can take any shape that he likes " to guard the child (Su 6.36.11).

(1) Cf. Joachim, *Die Diatetik und die Krankheiten des kindlichen Alters bei den alten Indern*, Arch. fur Kinderheilkunde 12, 174-253 (1891). (2) Cf. Bloomfield, Grund. II, Ib, 61 f. (3) Cf. Winternitz, *nejamesa, naigamesa, nemeso*.JRAS 1895, 149 ff.; Buhler,*Specimens of Jaina Sculptures from Mathura*, EI 2, 314-8.

§ 51. **Fever :—** At present about two-third of the death roll in India is, according to the statistical proofs, attributed to fever[1]. In medical works also it is considered as the king of all diseases. In AV also the disease *takman* which corresponds to the later *jvara* " fever " is the most dreadful disease[2]. In medicine the disease fever in human beings is considered as equal to the worst condition appearing in animals and nature such as madness in dogs, hollowness of trees, salt-desertness of soil and is frequently interwoven in myths. Thus it is said to have originated from Śiva's wrath-fire which became the frightful three-headed demon Vīrabhadra who disturbed the sacrifice of Dakṣa and even killed him and then harrassed the whole world in the form of fever with its companions nausea, joint-pains, headache, giddiness, fatigue, thirst, heat etc. (AS 3.1.256; Su 6.39.8–14; Car 6.3.15–25; AHr 3.2.1 f.; Hārīta 264, 134). The wrath-fire (*kopāgni, roṣāgni*) reminds us of the heat in fever, just as in Vedic medicine *takman* is connected with the fire-god (*agni*)[3].

Fever exists when there is simultaneous occurance of symptoms, namely absence of perspiration, heat and pain in all limbs (Su 6.39. 13 ff.). The general causes of fever are : improper use of fomenting and other remedies, wounds of various kinds, other diseases, the ripening (of tumours and the like), fatigue, infirmity, indigestion, poison, the smell of (certain) plants and flowers, grief, evil influence of stars or seasons, sorcery or malediction, clouded mind or possession and in the case of women difficult delivery or injuries during the confinement or the first milk-secretion in the breasts (l. c. 19–22). The tridosas of the body are deranged by such causes and are led astray so that the internal heat comes out rashly and the water element is retained. Therefore, a feverish man has a hot body and no sweat (Su l. c. 22 f.). There are eight different kinds of fever, seven of which are due to the derangement of one or more doṣas, and the eighth due to wounds and other external causes (Car 2.1.14; Su 6.39. 15–18; AS 3.2.260 f.; AHr 3.2.3). The common signs of an onset of fever are : fatigue, uneasiness, discoloration, bad taste in mouth, water in the eyes, heaviness and tearing in the limbs, want of appetite, nausea, sleepiness, yawning, laziness, tardiness, neglect of work, short breathing, alternative desire and dislike for sweet food, desire for warm, sour, salt and pungent things, excessive thirst, unstableness in walking, aversion to good advice, trembling, giddiness, delirium etc.

At the approach of these signs and at the beginning of fever, light food or fasts are recommended, because the fever takes its origin in the stomach. Decoctions, ointments, fomenting remedy, plaster, bath, emetic, purgative, nasal remedy, fumigation etc. are then to be applied according to the condition. At the outbreak of fever the symptoms change according to its kind. Thus the fever proceeding from deranged vāta is characterized by the following signs : disproportionate coming and staying of the temperature and pain in different parts of body, numbness and stiffness of the feet, cramp in the calf of the leg, the joints as if torn, pain in the hips, pricking in the chest, the bones—particularly in the back as if cut down, violent pain in the arms, shoulders and temples, inability of the jaws to chew, noise in the ear, bad astringent taste in the mouth, yawning, dryness of the mouth, throat, palate and skin, thirst, constipation and hard stools, flatulence, dry cough etc. Symptoms of the fever caused by pitta : simultaneous coming and increasing of feverish appearances on the whole body, particularly during digestion, by midday and midnight or in the autumn, inflammation in the nose, mouth, throat, lips and palate, bitter taste in mouth, heavy temperature, thirst and desire for cold, yellow colour of nails, eyes, face, urine, faeces and the skin (jaundice) etc. Symptoms of the fever caused by kapha : simultaneous occurrence of fever-symptoms on the whole body, particularly after eating, before midday, in the first half of the night or in spring, a feeling of heaviness in the body, loss of appetite, nausea, excessive sleepiness and dullness, cold, salivation, cough and heavy breathing, sweet taste in the mouth, feeling of slight chill and desire for warmth, white colour of nails, eyes, face, urine, faeces and the skin, urticarial rash on the body, subdued pain, stiffness etc. (Car 2.1.15–22; Su 6.39.25–34; AS 3.2.261 f.; AHr 3.2.6–22; MN 30 ff.).

Particularly dangerous is the fever caused by the derangement of all dosas (*saṁnipātajvara*) which, if coming in quite a pronounced form, is either incurable or curable with difficulty, and even if cured it leaves behind some permanent defect. On the 7th, 10th or 12th day this fever assumes a dangerous character whereupon it either disappears or leads to death. General symptoms : sudden change of heat and cold, pain in the bones, joints and head, the eyes drop water and are dim, irritated and crazy, the ears are ringing and painful, the throat is as if covered with thorns, there is sleepiness, senselessness,

delirium, cough, difficult breathing, nausea, giddiness, the border of the tongue is of a burnt colour and the tongue is rough to touch, there is looseness of limbs, spitting of blood and pitta mixed with phlegm, shaking of head, thirst, want of sleep, beating of heart, seldom and sparing secretion of sweat, urine and faeces, feebleness of limbs, continual noise in the throat, dark-red pustules and eruption, dumbness, inflammation of the passages, heaviness of the abdomen, slow digestion, madness, irrelevant speech, black teeth, excessive sleepiness by day, sleeplessness by night, excessive perspiration or no perspiration, constipation or frequent (but insufficient) stools, loss of strength, hoarseness etc. There are thirteen kinds of this fever the nomenclature of which varies and is differently reckoned and described. The *abhinyāsajvara* is commonly known in which eyes and ears do not function, smell and touch also disappear, the patient groans, speaks little or remains dumb, helpless, sleepy, and lies breathing heavily, delirious, desires no food, the tongue is stiff, the throat is dry, sweat, urine and faeces are stopped, the eyes drop and so on. Closely connected with this is *hataujas* or *hṛtaujas* characterized by complete loss of strength. At the termination of *saṁnipātajvara* a swelling appears on the "ear-root" which can easily become fatal (Car 6.3.101 ff.; Su 6.39.35 ff.; AS 3.2; AHr 3.2.27 ff.; MN 34 ff.; Bhāv 2.1.70 ff.; Vang 34 ff.).

The eighth kind of fever which proceeds from external causes (*āgantujvara*) can arise not only out of wounds and hurts of every kind but is also caused by strong excitation, particularly love, grief, fear or anger, possession, enchantment or malediction, the smell of poisonous plants or flowers, swoon, headache, trembling, vomiting, sneezing and other causes. It is also caused by poisoning, the symptoms of which consist of swoon, diarrhoea, black colour of mouth, heat and palpitation of heart etc. (Car 6.3.109–126; AS 3.2.263; AHr 3.2.38–45; Bhāv 2.1.103–6; MN 40 f.).

The intermittent fever (*viṣamajvara*) forms a further variety of fever which is divided into five subsections : [1] *saṁtata* :- lasts for 7, 10 or 12 days, but in certain cases takes a still longer duration. This fever especially affects the chyle (*rasa*) or chyle and blood, generally all elements of the body and urine and faeces. [2] *satata* :- affects the blood and comes twice in course of day and night, i.e. once

by day and once by night, or twice by day and twice by night (Aruṇadatta). [3] *anyedyuṣka* [Quotidian fever] :- affects the flesh and comes at any time once within twentyfour hours. [4] *tṛtīyaka* [Tertian fever] :- affects the fat and repeats at interval of a day. In this fever there is pain in the head,upper coccyx or back according to the deranged doṣa. [5] *cāturthaka* [Quartan fever] :- affects the marrow and the bones whereby there is pain either in bones or in the head, and repeats every fourth day or lasts for two days as *caturthaviparyaya* while the first and the fourth days are free from fever. This fever is especially dangerous. The 'hectic fever' (*pralepaka*) which appears in Suśruta as corresponding to the *saṁtata* of other authors is very scarcely curable. It also appears as a peculiar type of intermittent fever. It makes the limbs hot and heavy and results in the death of consumptives. Related to this is *vātabalāsaka*. *Balāsa* and fever come together already in the Vedic medicine, and by these chiefly malaria seems to have been characterized (Car 6.3.52–81; Su 6.39.51–58; AS 3.2.264 f.; AHr 3.2.56–74; MN 42 ff.; Bhāv 2.1.107–141; Vang 51 f.).

The fever is called "bodily" (*śārīra*) or "mental" (*mānasa* : typhus ?) according as it first affects the body or the mind. It is called " internal " (*antarvega*) if there is severe internal heat, " external " (*bahirvega*) if there is excessive heat in the skin. Cold fever is called *śītajvara*. The fever is " natural " (*prākṛta*) if it comes in rainy season, in autumn or in spring and is caused by the doṣas belonging to these seasons. It is " unnatural " (*vaikṛta*) if it comes at other times or does not proceed from the corresponding doṣas. It is called " unripe " (*āma, sāma*) in the following symptoms : salivation, nausea, fatigue, sleepiness, bad taste in the mouth, loss of appetite, passing of plenty urine, stiffness, constipation or undigested stools, acute fever with delirium etc. The signs of " ripening " fever (*pacyamānasya*) are : excessive chilliness, thirst, delirium, breathlessness, giddiness, laxity, and nausea. The fever may be considered as "resolved" (*nirāma*) by the following signs : hunger, lightness of limbs, relaxing of the fever, completion of period of first seven days. There is also another division of fever based on three different stages : *navajvara*, *taruṇajvara* upto 7 days, *madhyajvara* upto 14 days, *jīrṇa* or *purāṇajvara* of or less than 21 days. To the seven elements of the body correspond the seven kinds of fever residing in them. The fever

residing in marrow or bones is dangerous, that residing in sperm which is characterized by erections and loss of sperm is fatal (Car 6.3.32-51; AS 3.2.263 f.; AHr 3.2.46–56; MN 48 ff.; Bhāv 2.1.120–2).

The identification of the above descriptions with the modern fevers in India presents difficulties[4], yet the intermittent fever and the remittent fever especially coming after the rainy season and having devastating effects as well as the pneumonic (*pralepaka*) and the wound-fever (*āgantujvara*) can easily be identified.

Even though the Vedic medicine advises the surrender of the hot fever to the cold frog and the tying of a green-striped frog under the patient's bed, it also advises the application of *kuṣṭha*— a plant also used later as a remedy for fever[5]. The Bower MS contains numerous recipes for fever, and the effect of *harītakī* (*Terminalia chebula*) as remedy against the intermittent fever is praised therein (2.939). The later literature is also full of recipes for every kind of fever, yet the application of dietetic remedy is particularly recommended. In the first stage upto the 7th day (according to others upto the 10th day) from the beginning of the fever, the patient should generally eat nothing or only thin decoctions (*yavāgū*) and the like in small quantity. Ordinary water should not be denied to him, yet he should, as a rule, take only boiled and warm water, as the cold water increases the fever and medicines have also a bad effect in this stage. In fever which comes immediately after meal, an emetic is first to be given. In general, the rule is to prescribe fast in the beginning, then promotion of digestion by corresponding diet, lastly medicines and purgatives after the fever has gone down. In mild fever medicines may immediately be given. In intermittent fever both purgative and emetic should be given. Bleeding should be resorted to in every kind of fever only if all other remedies have proved futile. Fever should be understood to have ceased if the head and body have become light; fatigue, deafening and heat have disappeared, the mouth has inflamed, the head itches, there is perspiration, appetite and sneezing. Even then the patient must avoid exercise, sexual intercourse, bath, taking a walk and wind-draught until he has fully recovered his strength (Car 6.3.136–342; Su 6.39.83–299; AHr 4.1; AS 4.1; Bhāv 2.1.7–125; Vr 1.25 ff.).

(1) Baines, *General Report on the Census of India* 1891 (London 1893), 62. (2) Cf. Grohmann, *Indische Studien*, 9, 381 ff.; Bloomfield, l. c. 59 f. (3) Bloomfield l. c. 60. (4) Cf. Chevers, *A Commentary on the Diseases of India* (London 1886), 60 ff., 80, 263; G. Dacunha, *Dengue* (Bombay 1872); Baines, l. c. 62 f. (5) Bloomfield, l. c.

§ 52. **Diarrhoea, Dysentary and Cholera**:—The common designation of diarrhoea, *atisāra* (cf. Vedic *āsrāva*) which, even at present, is a frequent cause of death in Bengal (*morbus Bengalensis*) is etymologically so explained that the water-element in the body which is driven out by the deranged vāta, extinguishes the digestive fire, is mixed with faeces, loosens the same and flows excessively (*atīva sarati*, Su 6.40.4 = MN 65; cf. AHr 3.8.3 f. = AS 3.8.279). The following are the causes of such derangement : food that is pungent, heavy, excessively fat, dry, hot, liquid or cold, unsuitable to each other (like milk and fish) or injurious, if one eats too much or before digestion or drinks too much or drinks spoilt water or spirituous drink, poisoning, anxiety, grief, bathing for a long time, suppression of natural excretions, worms, haemorrhoids etc. Its signs are : pricking pain in heart, navel, anus, lower abdomen and the intestines, fatigue in the limbs, suppression of wind passing downwards, constipation, flatulence and indigestion. Further symptoms vary according to the kind of diarrhoea of which six kinds are commonly distinguished : 1. On account of the deranged vāta the stools are brown (MN) or dark (Su), sparing but frequent, phlegmatic, frothy, hard, noisy and painful, the urine is retained, there is restlessness in the intestines, hips and thighs are indolent, the rectum is prolapsed. 2. If deranged by pitta, the stools are yellow, green, watery, thin, bad smelling, hot, and are under pressure, the patient also suffers from thirst, fainting, fits, heat and perspiration in the body, fever and inflammation of the anus. 3. In the case of the derangement of kapha the stools are white, sticky,covered with phlegm, tough, slow, noiseless, frequent, cold, the patient is weary and sleepy, is without hunger, does not know when he has had a stool, the stomach, the anus and the bladder are heavy. 4. In the derangement of tridoṣas the stools are of different kinds (Su, MN, AHr), e. g. having the colour of whey, ghee, marrow, oil, fat or milk, or clear as water, or quite blue, red or black, smelling like carcass, pus or raw fish (Car). This form is particularly dangerous i. e. incurable. 5. If the cause is grief accompanied by insufficient feeding, the heat caused by the tears enters the bowels and disturbs the blood which then comes out with or

without faeces. This kind is also scarcely curable. 6a. In indigestion (*āma*, *āmājīrṇa*) the tridosas trouble the intestines and cause painful stools of manifoldly different colours (Su, MN). 6 b. The vāta is deranged by agony and causes quick, warm, watery and liquid stools. According to another division dysentary is to be divided as unripe or acute (*āma*) and ripe or chronic (*pakva*), similar to fever (Car 6. 19.4–16; Su 6.40.1–18; AS 3.8.279 f.; AHr 3.8.1–14; MN 64 ff.).

The *atisāra* is incurable if the stools are of abnormal quality e. g. having the colour of ghee, oil, fat, marrow, milk, whey and honey and if the patient suffers from thirst, heat, giddiness, dyspnoea, hiccup, pain in the sides and bones, speaking astray and other bad symptoms (Su 6.40.19–21; MN 70). The diarrhoea accompanied by fever is called *jvarātisāra*.

Diarrhoea with blood (*raktātisāra*) is caused by excessive use of food promoting pitta and occurs in the diarrhoea caused by pitta (MN 71 = Bhāv 2.1.138). Another form of diarrhoea which can also cause bleeding (dysentary), is *pravāhikā* ('flowing') caused by unsuitable diet. The diet promotes vāta which then drives downwards and out of the anus the collected phlegm mixed with faeces (Su 6.40.138 f = MN 72). The diarrhoea accompanied by vomiting is called *chardyatisāra*.

Closely connected with *atisāra* is *grahaṇī* or *grahaṇīroga*, *grahaṇīgada*— a kind of dysentary or chronic diarrhoea. *Grahaṇī* really means an organ above the navel, the seat of digestive fire that takes the undigested food and returns it in digested condition. If the *grahaṇī* is deranged by weakness of this fire, it sends out the food undigested (Car 6.15.54). Among its causes the neglected *atisāra* is particularly mentioned. In all cases the digestion is abnormal, stools are sometimes fluid, sometimes dry, thin, undigested, noisy, frothy, many times blue and yellow, or mostly phlegmatic, painful etc. Other less constant symptoms are : heart-burn, bad taste in the mouth, pain in the sides, thighs, chest, throat, vomiting diarrhoea, wasting, heat, fever and so forth. According to AS, AHr the difference between *atisāra* and *grahaṇī* is that the former disappears quickly, the latter gradually. The *grahaṇī*, moreover, lasts long and is also counted among the "major diseases" (Car 6.15.55–68; Su 6.40.166–177;

AS 3.8.180 f.; AHr 3.8.15–30; MN 74–78). A particularly bad form of *grahaṇī* is *saṁgrahagrahaṇī*. It is characterized by noise in the intestines, inertia, feebleness and fatigue. The stools are fluid or solid, sparing or plenty, oily, with pain in the anus, undigested, sticky, noisy, a little painful, occur daily or once in 10 days, 15 days or in one month. The disease is aggravated by day and there is amelioration at night (MN 78 = Bhāv 2.1.155 = Vang 127 f.). The incurable variety of *grahaṇī* is known as "Scoop-wheel" (*ghaṭīyantra*) with numbness of both sides of the body, colic and splashing discharge as in pouring out of a bucket (Bhāv 2.1.156).

The disease *viṣūcikā*, *viṣūcī*, is perhaps to be included among these, although it is dealt with in the medical works together with *alasaka* and similar conditions (cf. § 53). According to Wise, Dutt, Hoernle and AHr, *viṣūcikā* is "the cholera in its sporadic form"; yet there are other conceptions also[1]. It is Vedic and appears in the Vājasaneya Saṁhitā as the result of too much use of Soma. In medicine also it is attributed to immoderateness. In other literature also mention of this disease is not rare. Thus in Rajataraṅgiṇī (edn. Stein) 8.88 it is mentioned as an example of a fatal and devastating disease. Car 2.3 mentions *viṣūcikā* along with *alasaka* while dealing with the epidemiology. The name *viṣūcikā* ("in both the directions" i. e. from mouth and anus) is to be derived from the evacuation from above and below. The Medical works, however, trace it to *sūcī* ('needle') because in this disease the vāta pricks the limbs as if with needles. Symptoms : Swooning faint, diarrhoea, vomiting, thirst, colic, giddiness, crookedness of hands and feet (being the meaning of the word *udveṣṭana* according to the commentators), yawning, heat, change of colour of the skin, trembling, pain in the heart, and severe headache. The following five are the bad and fatal complications : Sleeplessness, uneasiness, trembling, retention of urine and senselessness. If the teeth, nails and the lips become blackish, consciousness is gone, there is severe vomiting, the eyes sink, the voice becomes feeble, all joints become loose, then the patient dies (Su 6.56. 3–11; MN 65 f.; Bhāv 2.2.24 f.; Vang 196). *Khallī* i. e. gouty pain in hands and feet (= *udveṣṭana*) is mentioned as a common accompaniment; similarly *pramīlaka*— drawsiness of eyes and *pipāsā*— thirst are also mentioned as accompaniments (Vr 6.60–62 along with comm.). The simultaneous occurrence of diarrhoea and vomiting is, however, considered as a special characteristic (Car 3.2.12–13).

The treatment of diarrhoea should commence with fasts. In acute diarrhoea (*āmātisāra*) suppressive remedy should not be given immediately, since many diseases such as jaundice, enlargement of spleen, tympanitis, flatulence, *grahaṇī*, swelling of the belly, haemorrhoids, fever etc. arise out of untimely supression. If the patient is thirsty, he should be given water in which certain astringent medical stuffs are boiled; if he is very much hungry, light food should be given. For acute diarrhoea a large number of astringents, like *Bel* fruit (*bilva*), Devdār wood (*devadāru*) etc. are recommended. Still more constipative remedies are recommended for chronic diarrhoea, then also various enemeta and so forth. In lingering diarrhoea milk boiled with three times quantity of water works like ambrosia. For *pravāhikā* similar remedies, particularly milk with different additions are recommended. In diarrhoea washings and baths, heavy or fatty food and physical exercise and heat should be avoided. If urine passes without faeces, wind passes (from the anus), if there is good appetite and the intestines are light, then the disease is regarded as cured. In *grahaṇī* buttermilk is specially recommended. Other numerous recipes are partly similar to those for *atisāra*. Things evoking hunger, constipating and promoting digestion are generally given (Car 6.19.17 ff.; 6.15.69 ff.; Su 6.40,25–137; 140–162; 178–181; AS 4.11–12; AHr 4.9–10; Vr 3.4). The Bower MS contains many prescriptions for these diseases. Later authors recommend mercury and opium.

In curable cases one should brand both the heels of the person suffering from *viṣūcikā* and warm (his body); a sharp emetic should further be given to him; when the diet is digested he should fast and take digestive and purgative medicines. When the body has become pure and swooning faint and diarrhoea have disappeared,strenghtening enemeta and various medicines should be given (Su 6.56.12 f.). An ointment is also prescribed for *viṣūcikā* itself or for the pains in the eyes and head caused thereby, a lukewarm smearing for gouty pains in the hands and feet and for colic, an emetic, enemeta etc. for the " dreadful *viṣūcikā* " in general, branding the heels for very old *viṣūcī*, which acts for bringing about the consciousness (? Vr 6.58 ff.). Similarly Vang 197–199, where salt water is recommended as emetic and hot pot for warming, and the pains in the *marman* are compared with the condition of one who has drunk poison; cf. also Bhāv 2.2. 26 ff. where pills and juices with Borax etc. are prescribed.

(1) Cf. Semmelink, *Geschiedenis der Cholera in Oost Indie* (Utrecht, 1885, pp. 494) with Prof. Kern's translation of Su 6.56 and Car 3.2 on Visucika; the same author. *Histoire du Cholera* (ibid. 1885, p. 169).

§ 53. **Additional Diseases of Digestion** :— Four kinds of digestion (fire) are enumerated already in the Bower MS 1.50 ff. : weak *(manda)*, excessive *(tīkṣṇa)*, irregular *(viṣama)*, regular *(sama)*. Similar statement is found in Su 1.35.24 where the ailments proceeding from these are also given : irregular (digestive) fire sometimes properly digests the food, sometimes causes flatulence, colic, constipation, diarrhoea, heaviness in abdomen, noise in the bowels, dysentary and causes vāta-diseases. Excessive digestion quickly digests even plentiful diet and causes dryness, burn and heat in the throat, in the palate and on the lips, as well as diseases of pitta. Weak digestion slowly digests even a small amount of diet and causes swelling of the body, heaviness in the head, cough, dyspnoea, salivation, vomiting, gout and diseases of kapha. Weakness of digestion *(agnimāndya)* is also considered as a particular ailing condition for which Vr 6.12, for instance, prescribed a pill consisting of *Asafoetida (hingu)*, the three myrobalans *(triphalā)* and other substances and the Bower MS already knows a powder that gives 100 years' life (2.43–55).

Closely connected with *agnimāndya* is *ajīrṇa* " indigestion " which is caused by excessive water-drinking, irregular meals, suppression (of hunger, impulse for stool or urine and other natural movements) and irregular sleep. Even light diet is not digested in *ajīrṇa* (MN 93). General signs : dizziness, stupifaction, distended abdomen, retention of wind, constipation or diarrhoea (ibid.). According to the deranged doṣa three forms— *āma*, *viṣṭabdha* and *vidagdha* are distinguished. *Āma* comes from kapha and causes heaviness, nausea, swelling of the cheeks and eyelids and eructation from the stomach immediately after meal. *Viṣṭabdha*, from vāta, causes colic, flatulence, manifold vāta-ailments, constipation of stools and wind, stiffness, numbness and pain in limbs. *Vidagdha*, from pitta, causes giddiness, thirst, swooning faint, manifold pains, sour eructation from stomach, sweat and heat (MN 91–93; Su 6.56.3). *Ajīrṇa* can lead to senselessness, delirium, vomiting, nausea, faintness, giddiness and even death. The following diseases are also considered as arising from *ajīrṇa* :— [1] *viṣūcī* (cholera nostras, cf. § 52), [2] *alasaka*

(" tympany, flatulence ") characterized by inflation and tension of the abdomen, noise in intestines, obstinate constipation, thirst and eructation, colic and trembling and giddiness, [3] *vilambikā* (" constipation ") a condition scarcely curable yet without pain in which the food neither goes upwards nor downwards (Su 6.56.3–9; MN 94–96; Vang 185, 196 f.; Bhāv 2.2.24 f.). Various kinds of pepper, *Asafoetida*, dry ginger, *sauvarcala*-salt, cinnamon etc. appear as ingrediants in the powders, pills etc. prescribed in the Bower MS 2.58 ff. for *ajīrṇa* and allied ailments. So also in later prescriptions. In all cases of *ajīrṇa* it is good to smear the belly with *Asafoetida*, pepper, ginger and stone-salt and sleep by day (Vang 186). For the treatment of *alasaka* and *vilambikā* similar rules as for *viṣūcikā* (Vang 199) are given, and so the Bower MS 2.80–84 already describes the preparation of a " Citron-pill " (*mātuluṅgaguḍikā*) which is equally applicable for *viṣūcikā* and *alasaka*.

The colic (*śūla*), a frequent disease even in upper classes[1] in Bengal of today, does not appear in the old pathology (Car, Su, AS, AHr) as an independent disease, although it is frequently mentioned along with other diseases such as constipation, diarrhoea and the like, or as a symptom. In wider sense, pricking pains of every kind are to be understood by *śūla*, " spear ", especially " spear of Śiva " as e. g. *pārśvaśūla*– "pain in sides", *hṛdi śūlāni*– "pain in the heart" (Bower MS 2.79). Frequently, however, it has a narrower meaning– " colic or violent pain arising from the bowels or stomach ", just as *parikartana, parikartikā* generally means " cutting ". According to MN 195–198 there are eight kinds of *śūla* : seven from the derangement of the doṣas, individually, in pair or united, and one from indigestion (*āma*). " Digestion-colic " (*pariṇāmaśūla*) and " colic of food and drink " (*annadravaśūla*) also belong to this. The complaints which give rise to these conditions are due mostly to different mistakes in the diet. *Pariṇāmaśūla* is caused during digestion. The accompanying signs in vāta are : flatulence, tympanitis, constipation, retention of urine, bad taste and trembling. Oily and hot medicines give relief to the patient suffering from this disease. In pitta : thirst, heat, bad taste, perspiration, deterioration by use of pungent, sour or salt things, amelioration by use of cold things. In kapha : vomiting, nausea, numbness, light but persistent pain. Relief is obtained by use of pungent and bitter things. In *annadravaśūla*, which arises during or

after digestion, it makes no difference whether one eats wholesome or unwholesome food, eats or observes fast or regulates diet. Only emetic is helpful in this condition (MN l. c.; Vang 441 f.; Bhāv 2.3.1 f.). Emetic, fasting, perspiration, remedies promoting digestion, suppository, cauteries and pills are recommended for curing *śūla* (Vr 26.1 = Vang 442 = Cakra 180). Hemādri also mentions a ceremony in which a golden and silver spear (*śūla*) is presented to a sacrificial priest, and the challenge is given to the spear to cure the *śūla* in the belly, sides or the back (*caturvargacintāmaṇi*, 1.755–757).

One who cannot taste the food put in mouth suffers from *arocaka*. If one shows disinclination at the thought of food or when one sees or hears of it, then it is *bhaktadveṣa* (nausea). If one has no desire for food, it is *abhaktacchanda* (Bhoja in citations). Enemata, purgative and emetic are prescribed respectively for *arocaka* arising from vāta, pitta and kapha. For *arocaka* arising from mental excitement, cheering up is recommended (Vr 14.3 = Cakra 117). Worse than *arocaka* is vomiting (*chardi*) which is related to it (Car 6.20; Su 6.49; AS 4.8; AHr 4.6; cf. MN 137 ff.). Vomiting is caused by food that is too fluid or oily, disagreeable or saltish, by untimely or too plentiful or unwholesome eating, through fatigue, exhaustion, excitement, indigestion, worms, eating too hastily, objects causing nausea and in the case of women at the beginning of pregnancy. There are in general five kinds of vomiting with the accompanying signs : pain in the chest and sides, in the head and the navel, dryness of the mouth, swooning faint, deafening of the ears, giddiness, faintness, thirst, fever, sweet taste in the mouth, heat, colic, indigestion etc. The case is hopeless if the wind goes upwards stopping the canals which drive out of the body the excrements, sweat, urine and water, the vomit smells like or looks like faeces or urine and the patient is vexed by thirst, breathlessness, hiccup and pain (MN). The treatment, as a rule, commences with fasts, then follow the emetics if the patient is strong and has uninterrupted severe vomitings, and then a purgative. The diet recommended is as follows :– food that is dry, light and agreeable, juice of grapes or sugar and other juices, very cold water, fragrance, various powders, decoctions, licking substances etc.,

The constipation already mentioned above as *vilambikā* is discussed in detail under the further conception of *udāvarta*, i. e.

cessation or retention of natural excretions and necessities like winds, faeces, urine, sperm, watering from the eyes, sneezing, eructation, vomiting, sperm, hunger and thirst etc. (Car 6.26.3–8; Su 6.55; MN 199–201; Vang 464–471; Bhāv 2.3.12–18). All these kinds of *udāvarta* are considered as causes of diseases. Thus the suppression of stools leads to flatulence, *śūla*, pain in the body, constipation, ascending of the wind or faecal vomiting. Closely connected or identical with this is the condition of *ānāha*. Accompanying signs in undigested faeces are : thirst, cold, heat in the head, pain in the belly,heaviness, a feeling of fullness in the chest, ceasing of eructation. If the excrements are digested, there follow stiffness in the hips and the back, constipation and retention of urine, colic, loss of consciousness, faecal vomiting and the signs of *alasaka* (see above). The suppression of wind going out of the anus leads, according to MN, Vang, Bhāv. to vāta-diseases, according to Su 6.55.7 f. to still worse results like colic, difficult breathing, headache, cough and sneezing, excretion of phlegm and bile and even faecal vomiting. The constipation is to be cured with suppository, enemata, purgative pills, powders and decoctions in ghee, also with perspiring remedies, smearings, baths, purging food etc. (Car; Su; Vang; Bhāv; l. c.; Vr 28 f.; Cakra 185–188).

By *amlapitta* according to Dutt (*nidāna* 181 note), dyspepsia with vomiting or diarrhoea, also blood-spitting, (perhaps by cancer), heat-burning and catarrh of the stomach are indicated. The older pathology (cf. AHr 3.5.42) scarcely knows this disease; according to MN 307–9 the physician knows its existence by indigestion, giddiness, nausea, pungent or sour eructation, heaviness, burning in the chest and throat and loss of appetite. If it goes downwards, it rouses thirst, heat, loss of consciousness, dizziness, nausea, jaundice etc. If it goes upwards, there is vomiting, in which the vomit is green, yellow, blue, black, reddish or blood-coloured, very sour, phlegmatic etc. The physician should first give an emetic, then a mild purgative, which are followed by smearing with oil and a clyster (Vr 53.1 = Cakra 304, cf. Vang 681–688).

(1) Cf. Chevers, *Diseases of India*, 550, 591.

§ 54. **Swelling of Abdomen :—** The purely external symptom of a partial or general swelling of the abdomen or the belly gives rise to the group of various diseased conditions like *gulma* and *udara*.

By *gulma* is meant a round, growthlike swelling hardness in the intestines between the heart and the navel. It is either firm or movable. Generally five kinds of *gulma* are distinguished which are known from the following symptoms : frequent eructation, constipation, a feeling of saturation, noise and unrest in the intestines, flatulence, weak digestion, retention of urine and the wind, going up of the wind. According to Caraka the vāta deranged by injurious or excessive food etc. causes pain in the heart, bladder, sides and the navel and even growths (swellings) of different kinds in *vātagulma*. The growth is sometimes larger, sometimes smaller, ails sometimes severely, sometimes only a little, by virtue of the activity of the wind it is felt as if ants crawl on the body, the patient has the feeling as if he were pricked severely with a needle or a nail, gets fever in the evening, his mouth becomes dry, his breathing is difficult, his hair bristle, the spleen swells, he suffers from flatulence, unrest in bowels, indigestion, pain in the limbs, in the head and in the temple; his skin, nails, eyes and mouth, his urine and stools become dark-brown etc. When caused by pitta the tumour burns and is weak and sensitive to pressure; skin, nails etc. becomes green-yellow, the patient suffers from fever, diarrhoea etc. When caused by kapha the tumour is firm and hard; the skin, nails etc. become white, the patient suffers from cold fever, gout in the joints, cough and sneezing, consumption etc. In the case of all doṣas an incurable combination of all symptoms occurs. A *gulma* which is particularly greater, pervading the whole body or is spherical like a tortoise is also incurable. *Raktagulma* occurs in women only as a result of retained amenorrhoea, particularly after an abortion or child-birth and is easily misunderstood for pregnancy by the ignorant. The symptoms of the first four *gulmas* partly appear to be connected with hyperamia of liver and spleen, partly with enlargement of the belly and tumour in the belly, partly with floating kidney, floating spleen and similar conditions. The enlargement of spleen (*plīhā*) appears also as a particular disease. The treatment of *gulma* is to be directed especially towards the removal of the deranged vāta; so nutritional and perspiring remedies are to be applied, then mild purgative, enemeta, lemon-juice and other juices of sour, salt and sweet taste, ghee with various additions etc. are to be given (MN 202-208; Car 2.3; 6.5; Su 6.42; AS 4.16; AHr 4.14; Vr 30; Vang 471-487; Bhāv 2.3.19.).

Ailments similar to the first four *gulmas* fall partly under the conception of *udara*. Persons particularly suffering from weak digestion (*mandāgni*) are attacked by *udara* in which the saturated dosas penetrate between the skin and the flesh and severely blow up the belly as a result of unsuitable diet and other injurious causes. There are eight kinds of *udara* with the following signs : loss of appetite, sweet taste, oily and fat-containing food is slowly digested, one does not perceive whether the digestion is complete or not, does not endure oversaturation, the feet are swollen, the bladder ails, one becomes void of strength and breathes heavily even with small exertions, the faeces are retained, the belly is blown up even by light and sparing diet, veins appear on it and the wrinkles disappear and so on. Further common symptoms are : flatulence, inability to walk, feebleness, weak digestion, swelling of hands and feet, giddiness in limbs, constipation and retention of urine, heat, looseness and getting lean. 1–4. The special symptoms of the first three *udaras* which are derived from the dosas are distinguished chiefly (cf. *gulma*) by dark, yellow or white colour of the skin and veins on the belly. In the derangement of all doṣas the patient becomes pale, lean and suffers from thirst. The derangement of all doṣas can also be caused by poison or by an incantation of love consisting of food mixed with nails, hair, urine, faeces or menstrual blood of women. 5. *plīhodara*. This is caused by prolapse and enlargement of spleen which becomes hard as stone and pushed like the back of a tortoise and fills the left side of the belly with violent troubles. Similar symptoms on the right side are called *yakṛddālyudara*. 6. *baddhaguda*. This is caused by constipating food or by hair or stone in the food. The symptom is that the faeces accumulate in the anus and come out only in small quantity with troubles. There is also thirst, heat etc. and formation of a swelling between the navel and the heart. 7. *parisrāvyudara* or *chidrodara*. This is caused by fish-bones, bones, wood, grass and other foreign bodies (*śalya*) in the food which wound the intestines and cause a flow of fluid from the anus with faeces and a swelling below the navel, with indigestion and other troubles. 8. *udakodara, dakodara, jalodara*. This is caused by untimely drinking of cold water. The belly is severely pushed as if filled with water so that it is felt and heard as a filled water-leatherbag. There is thirst, loss of appetite, prolapse and pain in the anus, feebleness, cough, breathlessness, swelling on the feet. etc. This is the ascitis coming already in the Vedas as thrown on

the sinners by Varuṇa, the god of waters. It comes also in Manu 8.82 as "the fetters of Varuṇa" with which he fastens the perjurers. In other *udaras* also water can be produced and then they, as a rule, are incurable. Congenital *udara* is similarly incurable. In *baddhaguda* and *chidrodara* the patient dies mostly after 14 days. Of the remaining *udaras*, those caused by vāta, pitta, kapha, spleen, all doṣas and water are in succession more dangerous than the former. Fatal symptoms are the encroachment of the disease complicating all the vital spots in the body, the skin gets wet and thin, there is pain in the sides, loss of strength, swollen eyes, diarrhoea and vomiting etc. If the light remedies are ineffective, then, in the case of *udara* caused by all doṣas, the patient should be given poison mixed with drink or food, or in a fruit in which an excited serpent has bitten. For this, however, the physician must secure permission of the friends, relatives or wife of the patient, or of the Brāhmaṇs or the king or the guru. In the case of *baddhaguda* or *chidrodara* the surgeon should, after obtaining permission, take an incision (leparotomy) in the belly with a correspondingly big knife, four *aṅgulas* below the navel on the left side, should open the intestines four *aṅgulas* broad and pull them out. He should then examine them, remove the hair, faeces, stone etc. stuck inside. In *chidrodara* he should likewise take out the foreign bodies, wipe off the excretion, and should cause black ants to bite the wounded place whereupon he should pull off their bodies, the heads being stuck inside. Thereupon he should smear the bowels with honey and butter, lay them again in their place and sew up the external wound of the belly (Car, Su, AS, AHr). In *dakodara* the surgeon should, of course with permission, take an incision on the patient while friends have held him fast and have covered his body with cloth upto the arm-pits, on the left side, four angulas below the naval with *vrīhimukha* (trocar), as deep as the broad part of the thumb, then place inside a tube of tin or other material or a quill and tap the water of dropsy, not at one sitting lest it may cause thirst, fever and other complications, but gradually within 16 days. The wound should be rubbed with oil and salt and bandaged and a cloth should be covered around the body. The diet should be limited to milk for six months and eating should be resumed after an year (Car 6.13; Su 2.7; 4.14; AS 3.12; 4.17; AHr 3.12; 4.15; MN 236–242; Bhav 2.3.78–86; Vang 535–561).

§ 55. **Worm-Diseases :**— The worms which play a prominent role as provoking disease in the European folk-medicine[1], especially in children's diseases, appear already in the Vedic medicine in different forms, not only as worms in the intestines, but also in the head, eyes, teeth and the nose[2]. The later medicine also knows worms in the eyes, teeth, ears, head, heart and those of other kinds. According to MN 97 f. (= Vang 200 f.; Bhāv 2.2.37) there are 20 kinds of external and internal worms. The former originate from the faeces or sweat on the skin (comm.). They resemble the sesame (*tila*) in size, form and colour, reside in the hair and the clothes, are either many-footed and are called lice (*yūkā*) or quite small, with the name *likhyā* and cause either a red eruption or itching boils. According to Car 3.7.10 (cf. 1.19.3 : *viṁśatiḥ krimijātayaḥ*) there are two kinds of external *kṛmis*, namely yūkā and pipīlikā. They stay in hair, beard, eye-lashes and on clothes.

The internal worms arise from the faeces, phlegm or blood as a result of various defects in the diet, want of movement, sleep by day, warmth and the like. Their existence is known by fever, pale colour of the skin, colic, pain in the chest, giddiness, exhaustion, dizziness, loss of appetite and diarrhoea. Of the internal worms, seven according to Su and only five according to Car, MN, originate from faeces. According to Suśruta they are white and small, others are broad and provided with tails, the *gaṇḍūpada* are red and long, and throng towards the anus. According to MN, they are broad or round, thin or thick, dark, yellow, white or black. According to Caraka some are partly tiny, round, white, like long threads of wool, some are large, round, dark-coloured, blue, green or yellow. They arise in the bowels and cause colic, indigestion, diarrhoea, constipation, salivation, loss of appetite, thinness, weakness, goose-skin, pale skin-colour, itching in the anus when they go below. If they have become large and climb into the stomach, they cause eructation and breathing that smell like faeces. From phlegm, according to Suśruta, are caused six kinds of worms with the names *darbhapuṣpa*, *cipiṭa*, *pipīlikā*, etc. According to MN, Car, they are seven with the names *antrāda* (devouring the intestines), *udarāveṣṭa* or *udarāda* (choking or devouring the stomach, tapeworm according to Wilson and Bohtlingk-Roth), *hṛdayāda* (heart-eater), *mahāguda* (longtailed), *curu*, *darbhakusuma*, (Darbha flower). They are produced in the stomach and crawl in all

directions, are hairy or have hair on the head, possessing tails, with dark-coloured rings, like a long stalk of corn or thread or an earth-worm or similar to fleshy muscle (?) thin, long or tiny, white or copper-coloured etc., devour the marrow, lick the eyes, disturb the palate and the ears, cause nausea, salivation, indigestion, loss of appetite, loss of consciousness, vomiting, fever, thinness, sneezing, cold, head-ache, pain in the chest etc. From the blood are caused seven (according to Car, MN, six) :— 1–3. *keśaromanakhāda* (devourer of the hair on the head and on the body and nails), 4. *dantāda* (teeth-eaters that cause decay), 5. *kikkiśa*, 6. *kuṣṭhaja* (arising from skin-diseases), 7. *parīsarpa* (a kind of leprosy). This is according to Suśruta. Caraka and MN have partly other names like *romadelpa* (destroyer of hair-roots), *audumbara* or *udumbara* (exciting a skin-disease). These *kṛmis* originating in blood are found in the blood-canals, are quite tiny (so one cannot see them partly on account of their smallness), red like copper, round and without feet. According to Su they are bloody, black, sticky, broad, they cause most of the blood-diseases, and are invisible. In Suśruta's opinion both the hair-destroyers are incurable. According to Car they devour the skin, veins, sinews, flesh and the cartilage when they have attained a large size (Car 1.19.3; 3.7.11; Su 6.54.1–19; MN l.c.). The question whether the tapeworm is mentioned by the name *udarāveṣṭa* or by some other name in what has preceded, is difficult to decide. Individual passages seem to prove the same; so also the earth-wormlike belly-worm and the thin, slender oxyurids (white, small, thronging towards the anus, causing itching in the anus etc.) are clearly distinguished.[3] As remedy for worms *viḍaṅga* (*Embelic Ribes*)[4] is mentioned very frequently. For lice, smearing with quicksilver (*rasendra*) etc. is recommended (Su 6.54. 20 f.; AS 4.22; AHr 4.20; Bhāv 2.2.39 f.; Vang 202–205; Vr 7).

(1) Cf. e. g. Lammert, *Volk-medicin in Bayern* (Wurzburg 1869) 128-135. (2) AV 2.31 f., 5.23. cf. A. Kuhn, KZ 13, 135-151; Zimmer, *Altindisches Leben* 393 f.; Grill, *Hundert Lieder des Atharvaveda* 2; 98-100, Bloomfield l. c. 61. (3) Letter communicated by Prof. Von Vierordt in Tubingen. (4) Cf. Dutt, *Mat. Med.* 187.

§ 56. **Diabetes :**— Morbid secretion of urine is generally called *prameha*. It is divided usually into twenty varieties according to the nature of the urine. Of these the following ten are caused by kapha :- 1. *udakameha* (Polyuria). The urine is clear, white, cold, smellless,

painless, abundent and waterlike. 2. *ikṣumeha*, *ikṣurasameha*, *kāṇḍekṣurasameha*. The urine is very sweet, cold, somewhat sticky, cloudy and resembles the juice of sugarcane. 3. *sāndrameha*, viscous urine. If the urine stands in a vessel, it becomes viscous. 4. *surāmeha*, *sāndraprasādameha*. The urine is like brandy or a sticky decoction. It resembles the spirituous drink Surā, is clear on the upper surface and viscous below. 5. *piṣṭameha*, *śuklameha*. The urine is plenty and white like water mixed with flour, the passing of urine is painful. 6. *śukrameha*. The urine appears like sperm or is mixed with it. 7. *śītameha*. The urine is very cold, sweet and plenty. In place of this Suśruta has *lavaṇameha*— white urine appearing like salt-water. 8. *śanairmeha*. The urine passes quite gradually. 9. *sikatāmeha*. The urine is mixed with sandy and tiny impurities, the passing of urine is painful. 10. *lālāmeha*, *phenameha*. The urine is phlegmatic or frothy, containing saliva or threads and passes only in small quantity (Albumineirhae ?). Six kinds are caused by pitta : 11. *kṣārameha*. The urine resembles alkali (water with potash) in smell, colour, taste and touch. 12. *kālameha*, black urine. The urine is black like ink. AS has instead *amlameha* that smells and tastes like buttermilk. 14. *nīlameha*. The urine is blue, clear and acid. 14. *śoṇitameha*, *raktameha*, *lohitameha*. The urine is bad smelling, hot, saltish and bloodlike. 15. *mañjiṣṭhāmeha*. The urine is (bright-red) like water mixed with Indian madder and very strong smelling. 16. *haridrāmeha*. The urine is (yellow) like water mixed with turmeric and is very bad-smelling. By vāta are caused four kinds : 17. *vasāmeha*. The urine is mixed with fat or looks like fat. 18. *majjāmeha*. The urine looks like marrow or is mixed with marrow. Su has instead *sarpirmeha* in which the urine looks like or is mixed with clarified butter. 19. *Hastimeha*. The patient passes continuous cloudy urine like a mad elephant. 20. *madhumeha*, *kṣaudrameha*. The urine is astringent, sweet, whitish and *tīkṣṇa*. This along with *ikṣumeha* (see above) is the sugar-diabetes, *diabetes mellitus*, and according to this Indians were conversant with the sweet taste of diabetic urine earlier than any other people (Haser). The *madhumeha* already comes in the oldest medical books like Bower MS and Caraka.

Prameha is caused by food and drink which is cold, oily, sweet, fat, fluid, new rice, milk or curds, sweets, excess in eating and other dietetic errors, also by want of exercise, tendency for sleeping,

lying or sitting, generally by everything that causes kapha, fat or urine. Its signs are : sweet taste in the mouth, thirst, numbness and burning of hands and feet, the limbs are oily, sticky and heavy, the mouth, palate and throat are inflamed, impure secretions are thrown out of the body, teeth and so forth, foul breething, continuous sleepiness and exhaustion, sweet and white urine run over by insects and ants etc.[1]. In all *pramehas* the urine is sticky and plenty. Besides in kapha there is indigestion, loss of appetite, vomiting, sleepiness, cough and sneezing etc. When caused by pitta, there is pricking in the bladder and urethra, the testicles are swollen, there is fever, heat, thirst, sour eructation, loss of consciousness, diarrhoea, yellow colouring of faeces, urine and the eyes etc. When caused by vāta, there is retention of excretions, trembling, pain in the chest, greediness, colic, sleeplessness, consumption, cough and difficult breathing. Various abscesses can also develop; these will be described later on[2]. All *pramehas*, if neglected, lead to *madhumeha* in due course and then are incurable. *Madhumeha* can also be caused by born sweetness of the body (Car 2.4; Su 2.6; AS 3.10; AHr 3.10; MN 222–233).

In all *pramehas* the patient should be given to drink juice of *dhātrī (Emblica Officinalis)* mixed with turmeric and honey after he is treated with perspiring, vomiting, purgative and enemetic remedies (Vr 35.16). In a series of recipes for *prameha* in Bower MS 2.603–608, more than twenty medical substances are recommended besides eating of barley-rum, broth of deer, milk, buttermilk etc. (Vr 35; Vang 520 ff.; Cakra 223–238; Bhāv 2.3.57 ff.; Car 1.17; 6.6; Su 4.11–13; AS 4.14; AHr 4.12).

(1) Even at present diabetes is frequently discovered by the fact that flies and the whole range of large black ants seek the chamber-pot (Chevers, *Diseases of India* 371 f.). (2) Carbuncles in diabetes are still frequent (l. c.).

§ 57. **Urinary Stone** :— A bladder-stone *(aśmarī)*, similar to the formation of bile-stone in cattle *(rocanā)* is caused when the vāta dries up the urine contained in the bladder along with sperm, bile or phlegm. The signs are : tympanic pain and painfulness of the bladder, severe pain in all neighbouring parts of the body like testicles and urethra, the urine smells like that of goat's urine, there is loss of appetite, fever and exhaustion. After the formation of stone,

there is pain in the navel, bladder, suture (of the scrotum) or the urethra while passing urine; the urine comes out only by drops if the stone blocks the way; on the contrary it comes out easily, clear as a precious stone and free from stickiness and sand if the stone is passed. Stagnation of urine and blood-urine can also occur, the latter particularly by shock and wound, as also by running, springing, swimming and other straining activities. Severe pain may also arise. There are four kinds of *aśmarī* : one each from the three doṣas and the fourth by defective sperm. In the first case children are particularly attacked by that. In their case, on account of smallness of the bladder stones can be easily cought hold of. The stone from kapha is white, smooth, bright, big like a hen's egg or is honey-coloured. On account of pitta it is reddish, yellowish or black, resembling a *bhallātaka* nut. If caused by vāta, the stone is dark-coloured, raw, uneven, like a flower of *kadamba* covered with small heights. In grown-ups, sperm-stone is caused by abstinence or excess in sexual intercourse (*śukrāśmarī*, Car 6.26.38; Su 2.3.1-12; AS 2.3.1-7; 3.9.281 f.; AHr 3.9.6-18; MN 218-221).

Lithuresis (*śarkarā*) is caused if the vāta dissipates a stone in small pieces or particles. If the vātadoṣa is favourable, the gravel goes out with the urine. If it is unfavourable it is retained. If the stone is connected with sand (*sikatā*) and gravel, the navel and the testicles are swollen, no urine passes, and the patient suffers from severe pain, the stone-disease kills him quickly (MN 221. Cf. Car l.c. 34 f.; Su l.c.8 ff.; AS l.c.; AHr 3.9.18 f.).

For stone and lithuresis many authors like Vṛnda 34, Vang 506-516 prescribe various decoctions, powders, solutions in ghee and oil and the like which, taken internally, dissipate or dissolve the stone. Bhāv 2.357 speaks only in short about the extracting with a hook of a stone which could not be cured by medicines and injections in the urethra. Car 6.26.40 mentions along with other medicines a drink that cures the stone " in case a surgeon does not extract it ". Cf. also Hārīta 639,317. According to Cakra 223, if the stone is not cured by medicines, a surgeon (*śalyavid*, *śastrakarmavid*) should press it down in order to bring it between the anus and the urethra with two fingers inserted in the anus, then should make a cut to the left side at a distance of a barley-corn from the scrotum and should

remove the stone. If unfortunately he cuts the bladder without bringing out the stone, the patient dies. He must remove the stone completely and must remove the blood from the bladder. When the stone is removed, he lets the patient bathe in warm water, anoints the wound with honey and butter and gives him sugar to eat in order to purify the urine, then a drink with urine-purifying substances for three days, rice with milk upto the 10th day, then perspiring remedy, then washing and anointing the wound. If it is not cured after 10 days, it is cauterized. If unfortunately the stone remains stuck to the navel (?), the navel is cut and the stone is extracted out. Exhaustive descriptions of important stone operations are given in Su 4.7; AS 4.13; AHr 4.11. The stone-disease is a dangerous ailment comparable to the god of death. It can be cured by medicines in the beginning; in a later stage an operation is needed. Since, however, even an expert surgeon is apt to make a mistake, permission must first be obtained from the king before undertaking the same. During the operation the patient should take support of a strong man. The patient should be seated on a bench and should be fast tied to the same with cords or ties. The entire region around and beneath the navel should be rubbed and should be kneaded with the fist until the stone comes down. When the stone is brought beneath the navel, the surgeon should insert the forefinger and middlefinger of the left hand smeared with oil and nails cut, in the anus of the patient along the perinaeum until he feels the stone, should bring it between the anus and the urethra and press on it, until it is prominent as a growth. If the patient faints during this procedure, the operation should be given up on account of the risk of life. Otherwise an incision should then be taken with a knife on the left side, a barley-corn farther from the scrotum, in certain conditions on the right side, corresponding to the size of the stone. The stone should not be dissipated or broken, lest the small remainders might grow again; so one must remove it completely with a hooklike instrument (*agravaktra*). In women the uterus lies close to the bladder; therefore, one must take no incision in the womb, as it would cause a wound-canal (fistula) carrying the urine outside. In men also the urine comes out if the urethra is cut. Other wounds can lead to death or impotence. A single incision of the bladder heals up again; the wound is to be treated as described by Cakradatta (see above); eventually it is to be burnt out after 7 days. If a stone or lithuresis develops

in the urethra, one should try to wash it out with the urine. If it does not go out, one should take an incision with a knife and extract it out with a hook. The operated person must avoid for one year after healing riding on a horse or an elephant, travelling in a carriage, swimming, climbing up a hill or a tree, eating heavy food and intercourse with women.

§ 58. **Strangury and Retention of Urine :—** There are in general eight forms of *mūtrakṛcchra* or *mūtradoṣa* (Su) 'strangury' : four from the dosas, individually or in combination,the remaining four from wounds *(śalyaja)*, faecal defects *(purīṣaja)*, stone *(aśmarija)*, and gravel *(śarkarāja)* or from sperm as mentioned in Caraka. The causes are defective diet, such as the use of pungent substances, spirituous drinks, flesh of animals in marshy places etc., overexertion, fast, riding and dancing. The urine passes frequently but only in drops and with pain. This causes violent pain in the bladder, urethra, chest, bloody urine and other abnormal changes in the urine, flatulence, retention of urine etc. (Car 6.26.30–33; Su 6.59.1–15; MN 211–213; Vang 494 f. The remedies recommended are various decoctions, purgatives, enemeta, injections in the urethra, nutritional and perspiring remedies, anointings etc. (Car 6.26.43–56; Su 6.59.15–27; Vang 495–9; Vr 32).

No strict line of demarcation is drawn between *mūtrakṛcchra* and *mūtrāghāta*, *mūtranirodha*, *mūtrarodha*, *mūtrapratighāta*. Thus out of the 13 *mūtrāghāta* which Car, Su, MN and subsequent authors mention, *vātakuṇḍalikā* i. e. circular turnings of spasms of the urinary tract caused by deranged wind is characterized either by complete retention of urine or by intermittent, droplike and painful passing of urine. In *mūtrātīta* the patient first retains urine and then desires to urinate; however, he does not pass any urine or passes only once with little pain and in a small quantity. In *mūtrasaṅga* the excreted urine remains obstructed either in the bladder, urethra or glans,or is emptied only quite gradually with blood and with or without pains. *Mūtragranthi*, a round, small, hard, stonelike tumour which is suddenly formed on the neck of the bladder causes pains as in stone and retains the urine. It appears to be a form of stone. *Aṣṭhīlā* " rounded growth " is perhaps related to hypertrophy, or inflammation of the prostate, a rounded, hard, fixed tumour which is formed

by vāta between the anus and the bladder, with violent pains, flatulence and suppression of faeces, urine and wind. Particularly dangerous is *bastikuṇḍala* (inflammation of the bladder ?) wherein the bladder loosened from its original place is raised like an embryo and the patient trembles by violent pains, convulsions and heat, urinates only in drops, and that also by pressing. If the bladder is spherical and there is thirst and uraemia, the disease is incurable. The treatment for retention of urine is essentially the same as that for strangury. In general, nutritional and perspiring remedies should be given first, then oily purgative, then injections in the urethra (Car S. 9.32–47; Su 6.58; AS 3.9; 4.13; AHr 3.9; 4.11; MN 214–218; Vr 33; Bhāv 2.3.38–45; Vang 500–506).

§ 59. **Chlorosis and Jaundice :—** By the name *pāṇḍu*, *pāṇḍuroga*, *pāṇḍvāmaya* are understood various disease-varieties of the skin-colour especially frequent in India. The Vedic *hariman* is perhaps not exclusively related to jaundice. According to Su there are four kinds of *pāṇḍuroga* which are based on doṣas. Other authors mention a fifth kind that arises from eating earth. Food that is sour, salt, too hot, unsuitable to each other or useless, sleeping by day, overexertion, sexual extravagance, suppression of natural excretions, excitation of mind by anxiety, fear and other injuries disturb the doṣas, particularly the pitta and cause various colourings of the skin : pale, yellow, greenish; yet the paleness prevails. The patient is poor in fat and blood, weak, his senses are loosened, the limbs are exhausted, the eyelids are swollen, there is exhaustion, irritability, he frequently spits out, speaks little, has no appetite, avoids cold, his hair fall down, the digestion is disturbed, has fever, breathes heavily, has whistling in the ears and dizziness. The disease is introduced by roughness and springing up of the skin, palpitation of the heart, loss of appetite, tendency for spitting and for eating earth, yellow colour of urine and of faeces, ceasing of sweat-secration, weak digestion, exhaustion, fatigue etc. Special symptoms in vāta are : the skin, eyes, veins, nails, faeces and urine are black, rough or brown, there is pain, pricking and trembling of limbs etc. In pitta : the eyes, nails etc. are yellow, there is heat, thirst, fever, diarrhoea, sweat, bad smell, bitter taste etc. This is jaundice according to Dutt.[1] In kapha : the skin, eyes, veins etc. are white, there is fatigue, heaviness, hoarseness, cough, flow of phlegm, goose-skin, difficult breathing, vomiting etc.

According to Dutt[1] this is anaemia. In the case of tridoṣas, there is combination of the above symptoms. By eating earth : according to the properties of the earth one of the doṣas is deranged, there is loss of strength of the limbs, digestion is weak, the skin becomes pale, the senses become dull, the eyelids, cheeks, mouth, navel, penis and feet swell, the faeces are thin and contain worms, blood and phlegm. This is Chlorosis according to Dutt[1]. A particularly bad form of jaundice is *kāmalā* characterized by intensive yellow colour of the skin, eyes, nails, urine and faeces and particularly of the face, with exhaustion, weakness, thirst, heat, indigestion, dispise of food and dullness of senses. By neglecting *kāmalā* there arises the dangerous disease *kumbhakāmalā* with excessive swelling and pain in the joints. Another sub-section of *pāṇḍuroga* is called *halīmaka*, the symptoms of which are greenish or dark-yellow colour of skin, dizziness, thirst, lingering fever, dislike for women, weakness, exhaustion, bad digestion, emaciation and the like.

All these diseaseful conditions can become incurable and can lead to death. Thus *pāṇḍuroga* is incurable after a long standing, if the skin is rough, the patient sees everything yellow, the digestion is hampered and there is scanty and phlegmatic yellowish diarrhoea, the teeth, nails and eyes are pale, the patient has swelling in the extremities and is thin in the middle, or if the anus, penis and the testicles are swollen, if he is senseless, has simultaneous diarrhoea and fever etc. For the curable forms there have been prescribed numerous recipes for purging, vomiting etc. among which mention may be made of the different iron preparations for the sake of comparison with the European treatment of chlorosis (Car 6.16; Su 6.44; AS 3.13; 4.18; AHr 3.13; 4.16; MN 100–106; Vr 8). On an interesting sympathy-cure for jaundice wherein the same is transferred to a bird tied to the bed of the patient, see Bloomfield, SBE 42, 264, 546, Kauśika sūtra 26.18 (Caland).

(1) *Nidana*, p. 54. According to Chevers, *Diseases of India* 714, almost all Hindu women are more or less anaemic.

§ 60. **Haemorrhage :—** The designation of all bleedings as *raktapitta, lohitapitta,* " blood-bile " proceeds from the fact that they are traced to the derangement of pitta that adversely affects the

blood. Bleedings upwards occur from the nose, eyes, ears or the mouth, bleedings downwards occur from the urethra, vagina and the anus. Besides blood can come out from all pores of the skin (AS, AHr, MN). The bleeding is preceded by exhaustion,desire for cold, loss of appetite, repeated vomiting, heat, a feeling as if smoke is coming from the mouth, breath smelling like the eatables or undigested food and the like, hoarseness, incapability to distinguish blue, red and yellow etc. The colour and consistency of blood change according to the three doṣas. Worse complications (*upasarga*) are : exhaustion, difficult breathing, cough, fever, vomiting, excitation, loss of consciousness, paleness, heat, headache, thirst, pain in limbs, loss of appetite and indigestion etc.

Raktapitta is curable if the bleeding occurs only from one direction, i. e. from the upper passages and is not too impetuous, does not last long, occurs in a good (cold) season, if there are no complications and the patient is strong. Bleedings from the lower passages can only be mitigated. Incurable bleedings are as follows :– in both the directions,if the blood is black,blue or variegated like a rainbow, is like dirty water or flows violently, the patient is weakened by suffering, has no appetite, frequently vomits blood, has red eyes etc. For bleedings upwards, purgative in general is to be given, for bleedings downwards emetics are to be given; for the latter the treatment for haemorrhagic diarrhoea is also prescribed. For nasal bleeding nasal remedies are to be applied (Car 2.2; 6.4; Su 6.45; AS 3.3;4.3; AHr 3.3; 4.2; MN 106–10; Vr 9).

§ 61. **Consumption and Tuberculosis :—** The consumption—one of the chief enemies of humanity in India even at present[1] " is accompanied by many other diseases and stands prominent among many other diseases, is called the disease[2] of the king (Soma) (*rājayakṣman*), consumption (*kṣaya*), pthisis (*śoṣa*) and king of diseases " (*rogarāṭ*. AS 3.5.1 = AHr 3.5.1). The shorter designation *yakṣman* also occurs. In the Vedas the compounds *rājayakṣma*, *ajñātayakṣma*, *pāpayakṣma* appear along with *yakṣma*; however, the Vedic *yakṣma* has, like most of the cognates (e. g. old slavic *yedza* " disease ") the meaning " disease " in general[3]. There is a Vedic myth that seems to attribute the consumption to the periodically waning moon[4]. Usually four kinds of causes of this disease are distinguished : excessive physical exercise, suppression of natural excretions,

sinking of basic elements of human body like the generative element, vitality etc. and injurious food and drink. According to another version consumption arises out of sexual extravagance, anxiety, old age, physical exertions, distant travels, ulcers and wounds in the chest (Su 6.41.16). Signs in the beginning are : cold, sneezing, phlegm, sweet taste in the mouth, feebleness of digestion and of body, loss of appetite, nausea for eating certain articles of food, vomiting, general debility in spite of taking food, swelling of the feet and mouth, whiteness of the eyes, desire for women, spirituous drinks and flesh, dissension, unusual growth of nails and hair, the patient is pursued in dream by moths, lizards, serpents, apes, birds and beasts of prey etc. Then follow the eleven characteristic symptoms of consumption : cold, difficult breathing, cough, pain in the shoulders and in head, loss of appetite if the disease has its place in the upper region, vomiting if it is in the bowels, pain in the sides if it is in the sides, fever if it rests in the joints (AS, AHr). Another enumeration mentions : pain in the shoulders and sides, burning of hands and feet, fever in the whole body (MN 113 f). Su 6.41.11 distinguishes six symptoms : dislike for food, fever, dyspnoea, cough, bloody excrement and hoarseness. A consumptive due to old age is lean, debilitated, weak in intelligence, physical strength and senses, trembling, without appetite, his voice becomes thin like beats on a broken metal-pot, his saliva contains no phlegm, he is troubled by heaviness and uneasiness, a discharge comes out of his mouth, nose and eyes, his stools and skin are dry and rough. In ulceration (*kṣata*) in the chest which is caused by excessive movements,carrying load, reading (loudly), shock or strokes, sexual extravagance or (other) overexertions, there appear blood, faeces and phlegm, the patient vomits yellow, red, black and brown in coughing, his chest aches and he feels himself very miserable by heat in the body, his mouth and breath smell bad, the colour of his skin becomes pale and his voice is broken (Su 6.41.17–27).

A physician aspiring for fame should not treat a consumptive who is affected with the eleven symptoms (see above) or the six : cough, diarrhoea, pain in sides, hoarseness, loss of appetite and fever, or has the three : fever, cough and haemorrhage. On the other hand, he should treat a strong patient who has got a good digestion, is not thin and is not sick for a long time. After a year the ailment can be

lessened (Su, MN). Of the numerous remedies for consumption mention may be made of the long revered recipe *Cyavanaprāśa* (Bower MS 188–200 = Car 6.1.25 = Vr 10.29–42 = Cakr 101) " the food of Cyavana " that made this aged seer young. It consists of a decoction of butter and molasses with many medicinal substances. Purgatives, emetics and the like suit only to a strong patient; in the case of a weak patient they would work as a poison. One must also cheer up the mind of the patient by fragrance, music, friendly talk, intercourse with beloved friends and women and the like (Car 2.6; 6.8; Su 6.41; AS 3.5; 4.7; AHr 3.5; 4.5; MN 111–20; Vr 10).

(1) Cf. Chevers l. c. p. 520 (2) The word cannot mean " king's evil " (syphilis ?) as proposed by Bloomfield, SBE 42. 647, but " the most important disease ", cf. *rogarat*, and the compositions analogous to *raja-*. (3) cf. Zimmer, *Altindisches Leben*, pp. 375 ff.; Bloomfield, Grundr, l. c. p. 60. (4) Zimmer l. c.

§ 62. **Cough, Asthma and Hiccup** :— Cough (*kāsa*) and difficult breathing (*śvāsa*) appear very often as symptoms of a disease either combined or separately, e. g. in consumption (cf. § 61); however, both are considered and described as independent diseases. Of *kāsa* there are five kinds, worse in sequence : 1–3 caused by the derangement of the doṣas, 4th by (internal) ulcers (*kṣata*) and 5th by consumption (*kṣaya*), and they lead to tuberculosis if neglected. Signs of cough are : itching in the throat, a feeling as if the throat and the mouth were full of pricking insects (*śūka*), sticking of the food (in throat), hoarseness, loss of appetite, weak digestion. The ulcerative variety is defined as similar to the consumptive variety. The former is caused by internal ulcers of the chest, physical exercise, carrying load, shock and strokes and the like. The patient first coughs dry, then spits blood, the throat aches acutely, the chest is as if cut, he has a feeling as if he were pricked with sharp needles, fever, difficult breathing, thirst, hoarseness, his voice sounds like the cooing of a pigeon, his strength, appetite, digestion gradually relax, he becomes pale, waned, suffers from blood-urine, pain in the back and hips. The cough due to consumption (*kṣayaja*) is evidently a form of consumption : the discharge is bloody, suppurated, bad smelling, yellow, greenish or red, while coughing the patient has a feeling as if the heart had sunk to the bottom, suffers from fever, pain in sides, cold, hoarseness, eats much, but still becomes weak and pale; all signs of

consumption then develop. This disease is incurable in the case of weak persons, otherwise and in other forms of *kāsa* nourishing and perspiring remedies, linctus remedy, enemeta, emetics etc. are recommended (Car 6.18; Su 6.52; AS 3.3; 4.4; AHr 3.3;4.3; MN 120–4; Vr 11).

Dyspnoea (*śvāsa*) and hiccup (*hikkā*) proceed from similar causes, viz. dust, smoke, wind, cold, cold drinks or eatables, physical exercise, sexual extravagance, injurious food and the like, particularly appear as the conditions consequent upon the most varied diseases like dysentery, fever, cold, bleeding, chlorosis, cholera, excessive cough etc. The beginning symptoms are : pricking in the chest and the sides, flatulence and constipation, unpleasant taste in mouth, pain in the temples and irregular breathing. Of the five kinds of dyspnoea, *kṣudraśvāsa* is caused by overexertion or overeating; it however, arises only when one exerts oneself, not when one is sitting. It causes no trouble in swallowing and disappears of its own accord. In *tamakaśvāsa* or *tamaka* " oppressive feeling " the patient has noisy cough with phlegmatic discharge, excessive thirst, perspiration and nausea, rattling in the throat, breathing is very severe and vexing, he feels very uneasy until the phlegm comes out, feels relief for a moment after it has come out, can speak only with trouble, gets no sleep, sitting brings him ease, he has desire for warm, his condition worsens by bad weather and use of phlegm-promoting things. The disease is called *pratamaka* if there is loss of consciousness and fever is present. In *cchinnaśvāsa* the patient breathes only with interruptions or can obtain no air with all exertion, while all his joints are pained, the belly is swollen and constipated, the bladder is inflamed, the eyes roll, one of the eyes is red, the mouth is dry, there is perspiration, disjointed talk, dejection, numbness and senselessness. Such patients die quickly. In *mahāśvāsa*– acute breathlessness the patient breathes unceasingly with great noise like a raging bull, he has unrest, his eyes roll, his voice is indistinct, the throat is dry, urine and faeces are retained, ears, temples and head very painful, he loses intelligence, his breathing can be heard at a distance. This condition also quickly leads to death. In *ūrdhvaśvāsa* the patient breathes out, but cannot breathe in, the mouth is obstructed by phlegm, the eyes are directed upwards and ramble around unsteadily, the joints ache, the voice is inaudible, he loses consciousness and becomes exhausted and dies. The cure for *śvāsa* consists of perspiring remedies, emetics, various butter decoctions, pills etc.

Hiccup (*hikkā*) has the same causes and also the same prodromal signs as the *śvāsa*. It is also distinguished in five kinds among which there is a mild and an acute kind.The latter as well as *gambhīra*—the deep hiccup that comes from the navel, are incurable, especially when the whole body trembles during hiccup, the sight is rigidly directed upwards,the patient is weak and does not desire to eat,sneezes very severely, becomes lean, is exhausted by disease and so on. As remedy for *hikkā* massage with oil, perspiring remedy, goat's milk, tight bandaging above the navel, liquid medicines etc. are mentioned (Car 6.17; Su 6.50f.; AS 3.4;4.6; AHr 3.4;4.4; MN 124–32;Vr 12).

§ 63. **Heart-diseases** are pretty well summarily treated under the general name *hṛdroga*, *hṛdāmaya*, *hṛdayāmaya* "heart-disease". They arise out of hot, dry, heavy, too plentiful feeding and other defects in diet, also out of overexertion, wounds, suppression of excretions, anxiety, fright etc. and are divided into five kinds, four originating from doṣas and one from parasites. General signs are : paleness, faint, fever, cough, difficulty in swallowing, difficult breathing, bad taste, thirst, delirium, vomiting, discharge of phlegm, pain, loss of appetite (Car). In the parasitic variety (cf. § 55) there is nausea, spitting, pricking, needlelike pricking and boring or cutting pain in the chest, salivation, delirium, loss of appetite, dark colour of eyes, consumption as well as signs as in worms caused by the presence of excessive phlegm, i. e. a discharge from the mouth, indigestion and the like. For the first four heart-diseases various decoctions with butter, emetic and purgative, enemata, cold poultice etc. are to be given. For parasites, medicines prepared with the well known worm-remedy *viḍaṅga* should particularly be given, whereby worms present in the heart-area fall down (Car 6.26; 1.17; Su 6.43; AS 4.8; AHr 4.6; MN 209–11; Vr 31; Bhāv 2.3.2 ff; Vaṅg 488 ff.). The expressions *urograha*, *uroghāta*, *vakṣastoda*, *urovibandha* " pain in the chest, oppression of chest " may also be mentioned. By *urograha* (pleurisy-BW) a dangerous disease is to be understood according to Vaṅg 493 ff. The signs are : pain, sensitiveness to pressure, flatulence, swelling of the belly and heart, retention of wind, urine and stool and loss of appetite. The treatment consists of perspiring remedy, heating, blood-letting etc. On Vedic heart-diseases, see Bloomfield, SBE 42 pp. 7, 12, 40, 269, 471.

§ 64. **Diseases of Larynx** :— Hoarseness (*svarabheda*) is frequently mentioned. It proceeds from excessively loud speaking or reciting, poison, wound, cold and is divided into six kinds depending on doṣas, fattiness and consumption. The voice is hoarse, dull and rough as a donkey cries, or the throat is inflamed or is full of phlegm and renders speaking very difficult, or the voice is choked as by smoke and quite inaudible or quite sticking in the throat and indistinct. Lukewarm water, ghee and molasses with various additions etc. are given therefor as drink, also emetic and purgative, enemeta and nasal remedy, fumigating and linctus remedy etc. (Car 6.26; Su 6.53; AS 3.5; 4.7; AHr 3.5; 4.5; MN 133–5; Vr 13).

By *rohiṇī*, *rohiṇikā* (redness) is meant acute growth at the root of the tongue (in throat ?) connected with manifold pain. It brings death after three days at the latest, but can quickly be cured by an expert physician (Car). The death results from suffocation when caruncles shut up the throat. There are also milder forms, particularly one brought about by blood, in which numerous small pustules appear. The curable cases are to be treated with blood-letting, emetic, fumigation, gargle and nasal remedy (Su, Vr, Bhāv). The growth *galagraha* originates from the hardening of phlegm in the throat (Caraka). Connected with this is *kaṇṭhaśūlūka*— a hard and rough tumour in the throat originating from phlegm and causing pain like thorns or pricking insects (*śūka*). It is to be removed by operation. A growth on the tongue raised like top of the tongue is called *adhijihva* and is dangerous if suppurated. The high and extended swelling *valaya* that obstructs the admission of food is incurable. Whether *balāsa* which is equally dangerous and causes breathing difficulties and pain, corresponds to the Vedic *balāsa*[1] is doubtful, since *balāsa* also denotes the phlegm as exciter of disease in general. Directly fatal or at least highly dangerous are *śataghnī*— a hard, painful swelling blocking the throat with many caruncles, *galavidradhi* "abscess in the throat"— a growth covering the whole throat, *galaugha* "swelling of the throat" —also a big swelling that obstructs breathing, eating and drinking, *svaraghna* "corrupting the voice"— blocking up of the air passage by phlegm, with hoarseness, difficult breathing and dryness, *māṁsatāna* "flesh-lump" (polype in the throat–BR)— a hanging growth that gradually covers the throat etc. In all there are eighteen diseases of throat (*galaroga*) including the five *rohiṇī*. Whether croup and

diptheria are to be counted among these, cannot be decided because of the generality of the descriptions (Car 1.18; Su 2.16; 4.22; AS 6.25; AHr 6.21; MN 346-50; Vr 58; 53 ff.).

(1) Cf. Bloomfield, SBE 42, 450.

§ 65. **Thirst and Burning, Fatness and Thinness**:— Thirst and burning— a usually accompanying sign of fever and other diseases, are also dealt with as independent diseases. Diseaseful thirst (*tṛṣṇā*) is that in which one does not get satisfaction in spite of continuous water-drinking, but desires to have still more water (Su). The diseaseful thirst begins with dryness of mouth, lips, palate and throat, constant desire for water, heat, burning, delirium, exhaustion and irrelevant talk. Then follow pricks in temples and in throat, bad taste in mouth, loss of appetite, sleeplessness, yellow colour of the eyes, urine and stools, cold fever, inflammation of the skin, voicelessness, salivation, pain in chest, excessive dryness, desire for cold and other signs according to the kind of origination of thirst. The case is hopeless if the patient is exhausted, unconscious and deaf and stretches out his tongue. The treatment chiefly consists of giving cold water with various additions, milk and other liquids (Car 6.22; Su 6.48; AS 3.5; 4.8; AHr 3.5; 4.6; MN 141-4; Vr 16).

Dāha— heat or burning is divided into seven kinds. *Dāha* by pitta shows signs similar to the fever caused by pitta and is to be treated as such (cf. § 51). Similar treatment should be given also in the case of the severe burning of the skin caused by the use of spirituous drinks. If the surplus blood causes heat, it pervades the whole body, the patient feels like burning, looks red and has red eyes. He who does not quench his thirst by ignorance, feels internal and external heat, his palate, throat and lips are dry, his tongue hangs out and he trembles. If blood flows from a wound, heat is produced which it is difficult to cure. The heat that originates from wound of a major part like head, heart or bladder is incurable, so also the heat caused by extinction of bodily elements (consumption), and (internal) heat in which the limbs are cold is incurable. For cure ointments— especially of sandalwood, should be used, or the whole body should be wrapped in a piece of cloth moistened with sour gruel, or the patient should be cooled with fans, he should be seated in a

waterpot, water should be sprinkled upon him, he should be given syrup to drink and general remedies for pitta should be used (MN 158 ff; Vr 19; Bhāv 2.2.121–4; Vaṅg 322 f.). On burning of the feet (*pādadāha*) see § 89.

The obesity (*medas, medodoṣa, medovṛddhi*) originates from want of movement, sleeping by day and phlegmatic diet and causes accumulation of fat, particularly in abdomen, incapability for every work, short breathing and stagnation of breathing, thirst, delirium, sleepiness, weakness, desire for eating, bad smelling sweat, less tendency for cohabitation. In course of time it also causes dangerous diseases like erysipelas, fistula-in-ano, fever, diarrhoea, diabetes, haemorrhoids, elephantiasis, jaundice which lead to death. The treatment chiefly consists of regulation of diet and mode of life, hence walking, movement, cohabitation, marching, fatigue and the like are recommended (MN 234 ff.; Vr 36; Bhāv 2.3.69 ff.; Vaṅg 528–35. Cf. Su 1.15; Car 1.21).

Thinness (*kārśya*) arises from dry or insufficient diet, fasts, overexertion, suppression of necessary sleep, cohabitation, grief, sorrow, chronic illness and the like and leads to enlargement of spleen and swelling of body, cough, consumption, asthma, haemorrhoids and other difficult diseases. Congenital thinness is incurable; for acquired thinness substantial and strength-giving things, aphrodisiacs and the like should be given (Bhāv 2.3.75 ff. Cf. Su 1.15; Car 1.21).

VI. External Diseases

§ 66. **Small-pox**[1] :— Small-pox does not occur in the Atharvaveda and the Bower MS. Su, AS, AHr and even Śārngadhara mention it only under smaller ailments (*kṣudraroga*) which are mostly skin-diseases. Caraka passes it over in his enumeration of diseases (1. 19) and mentions it only briefly along with measles as an eruption on the whole body that is to be treated like St. Anthony's fire and leprosy (6.12). It is called *masūrikā*, *masūrī*, "lentil-disease" of the form of pustules. Thus Vāgbhaṭa says (AS 6.36; 3.15 = AHr 6.31.8) : " (Small-pox is) hard pustules on the limbs and in the mouth, of the size and colour of a lentil (*masūra*) and is named thereafter (and is) connected with heat, fever and pain "; similarly Su 2. 13.38. Small-pox is to be treated like other skin-diseases, chiefly with ointments (Su 4.20.31). AHr 2.5.111 points out the dangerousness of small-pox : one on whose body *masūrikā* appear like small coral balls and quickly disappear, is no more. AHr 3.10.38 also mentions it as a disease consequent to diabetes. The later works contain precise information. Small-pox originates from injurious food, particularly pungent or salt, and other defects in diet, from air and water that are corrupted (by poisonous flowers and the like), and from the appearance of an irritated planet. This last cause is related to small-pox epidemic, since the small-pox appears in those regions where the angry planets are visible (Caraka). The disease is introduced by fever, itch, tearing pain in limbs, uneasiness, giddiness, swelling of the skin, change of complexion and redness in eyes. In the case of vāta the pustules are dark-red, rough, hard, cause violent pain and become ripe slowly. This variety is incurable. In the case of pitta they are red, yellow or white, cause burning and violent pain and ripen quickly. There is pain in joints, cough, shaking, uneasiness, weakness, dryness of palate, lips and tongue, thirst and loss of appetite. In the case of blood there is diarrhoea, heat in the body, thirst, uneasiness and loss of appetite, inflammation of the mouth, redness in eyes, and especially strong fever, as well as the signs as in pitta. In the case of kapha the pustules are white, glittering, very big, cause itch, but little pain and ripen slowly. At the same time there is phlegmatic flow, paresis, headache, heaviness in limbs, nausea, loss of appetite, sleep, weakness and dislike. In the case of all doṣas they are big, blue, sunk in the middle, very painful, ripen slowly, contain stinking pus and are

called *carman*. There is difficulty in swallowing, loss of appetite, weakness, talking astray and disgust and the disease is scarcely or not at all curable. Further varieties depend on whether the pustules invade the chyle, blood, flesh, fat, marrow, bone or the generative element. If they invade the skin (i. e. chyle) they resemble a waterdrop, are very harmless and let out water when they crack (water-pox). In blood they have the colour of blood, ripen slowly, have a thin skin,contain blood.In the remaining varieties the symptoms are worse by degrees and the pustules invading the bones or the generative element bring death quickly. The following are additional signs of incurable disease : the pustules appear like corals, Jambū fruit, iron-bullets or lentils, there is cough, hiccup, delirium, violent fever, talking astray, disgust, faint, thirst, heat and uneasiness, blood flows from the mouth, nose and eyes, a rattling is heard in the throat and the respiration is extremely painful, the patient breathes by nose only with exertion and is troubled by thirst. A swelling on the elbow, wrist or shoulder-blade arising after the small-pox is scarcely curable. Among the numerous remedies for small-pox mention may be made of the internal use of quicksilver (*pārada*, Cakra. 315) which is certainly not very old, and of the various recipes for mixture of medical stuffs with cold or very cold water (MN 316–21; Vr 56; Vaṅg 700–9; W 314–8; Bhāv 2.4.53–9).

Śītalā— an apparently later subsidiary form of this disease, is mentioned[1] in connection with the cold treatment for small-pox which in all probability is meant for fever accompanying it.This name of small-pox represented even at present in modern Indian languages, is referred to only in Bhāv, yet the śī*talikā* connected with this is mentioned as a popular designation for small-pox (*lokāśrayā saṁjñā*) already in Ḍallaṇa on Su 2.13.38 i. e. in the 12th century. The Bhāv (16th century) divides śī*talā* into seven kinds, but describes eight kinds. 1. The big śī*talā* (*bṛhatī*) is characterized by big pustules the appearance of which is preceded by fever. After seven days the pustules become visible, within next seven days they ripen, in the third week they dry up and disappear by themselves. 2. *kodravā* originates from vāta and kapha, the pustules appear like the rice *kodrava* (*Paspalum scrobiculatum*), do not become ripe, but are cured without medicine within 7–10 days. 3. *ūṣmajarūpā*—" appearing like insects " is caused by heat. 4. *pāṇisahā*— " enduring the hand ".

The pustules itch, but tolerate the scratching with hand and dry after seven days. 5. *sarṣapikā*— "mustard corn" : the pustules have the colour like that of a yellow mustard. 6. *rājikākṛti*—"having the form of *rājikā*, a kind of mustard" (*Sinapis ramosa*). This variety is caused by heat, occurs only in children and dries up easily by itself. 7. The pustules are red, elevated and round, like a red spot, there is pain, fever precedes them and lasts for three days. 8. *carmajā* "originated in the skin" : the pustules become blended together. Vernacular names are also mentioned along with the Sanskrit names. The cure of *śitalā* results in many cases easily and without treatment; other cases are incurable in spite of all remedies. The remedies, particularly for the first variety, consist of sprinkling the split up or unripe pustules with ash of cowdung, applying cold (*śitala*) water which need not be boiled even during the fever, removing the patient to a cold (*śitala*) distant place where nobody is permitted to meet him, driving out the flies with twigs of *nimba* and yellow candock leaves, giving a decantation (*phāṇṭa*) of cold water with sandal-wood and other fever remedies for pacifying the fever. It is, however, said that "many physicians generally give no medicine". In the whole house *nimba* leaves should also be spread over. Principally, however, the goddess *śitalā* who governs all forms of appearance of this disease should be worshipped with sacrificial gifts, ceremonies and a hymn from the Skandapurāṇa which a pious Brāhman should recite. The hymn is denoted as *śitalāṣṭakam stotram*, and the goddess *śitalā* riding on an ass is invoked therein as the life-elixir for a patient who has got fever, is affected with bad smelling (pus) and is deprived of eyesight (Bhāv 2.4.59–63).

The cult of seven small-pox sisters whom the above seven forms of *śitalā* evidently correspond and particularly the *śitalā* is even at present very much spread in North India[1]. *Śitalā* rides on an ass, she resides in the *nimba* tree, that is why the patient is also fanned with *nimba* leaves, *nimba* leaves are hung in the door of the patient's room and are put in a waterpot in the patient's room. *Śitalā* is specially worshipped by women and children, because the above sixth variety of *śitalā* is confined to children. *Camariyā*—the oldest of the small-pox sisters whom a particularly bad form of small-pox with confluent pustules is attributed, corresponds to the eighth *carmajā* or *camaragoṭī*. In south India also the divination of small-pox is a

common practice. A goddess *Basuri* prevailing there in the 17th century is perhaps to be identified with *masūrī*.[4] At present small-pox is evidently the most prevalent children's disease and one of the most dangerous diseases in India[5]. In view of the above information small-pox appears as a difficult, complicated and epidemic disease from Mādhavanidāna onwards. In AHr it is considered as dangerous; in Su, AS it is only a light skin-trouble which, according to Wise[6], is to be considered as a mild form of the later epidemic small-pox, and in the oldest medicine it is completely absent. The often expressed view that small-pox existed in India much earlier than in Arabia and that it reached Arabia from India is thus in no way to be considered as certain; still less acceptable is the view of Chevers[7] that the priests of *śītalā* were the oldest vaccinators. No trace of any vaccination can be discovered in older medical literature[8], the worship of *śītalā* as small-pox goddess is foreign to it and no personification of the small-pox appears among the numerous ancient personifications of children's diseases.

(1) Cf. herewith Orth, *Bemerkungen uber das Alter der Pockenkenntnis in Indien und China*. Janus v, 391-6, 352-8. (Amsterdam 1900). and my addenda to it, Janus v, 577 ff. (2) Cf. Wise, *Commentary*, pp. 235ff. (3) Crooke, *Popular Religion of Northern India* (London 1896), 1. 125-36. (4) Cf. Stuart, *Madras Census Report* (Madras 1898) pp. 58 ff.; Orth, l. c. (5) Cf. *General Report on the Census of India* 1891, 62. (6) *Review of the History of Medicine*, 2, 108. Orth, l. c. (7) *Diseases of India*, 45 ff. (8) The Sanskrit citation on vaccination communicated by Ainslie (cf. Bohlen, *Das alte Indien*, 2, 219) is evidently a modern falsification. cf. Haas, ZDMG 30, 660 ff.

§ 67. **Minor Diseases** (*kṣudraroga*):— This group of diseases originally also comprising small-pox is already alluded to in the Bower MS (1.100, cf. 2. 86) and consists chiefly of different affections of skin. The group consists of 36 diseases in AS and AHr, 44 in Su, 43 in MN and 60 in Śārṅg. MN excludes small-pox from the group and treats it as an independent disease (§ 66). The following enumeration is based on MN, the meanings are mostly given in the appendix to Dutt, *Nidāna* 193 f. :— 1. *ajagallikā*— warts in children. 2. *yavaprakhyā*— very hard snob or humpback in flesh of the size of a barley-corn. 3. *antrālaji* (*andhālaji*–Suśruta)— a firm round tumour (abscess) with little pus. 4. *vivṛtā*— round tumours appearing like ripe figs. 5. *kacchapikā*— scrofulous gland-swelling.

6. *valmika* ("anthill")— slowly swelling snob on the throat, hands and feet etc. expanding like erysipelas. 7. *indraviddhā (indravṛddhā)*— Herpes. 8. *gardabhikā*— round painful boil (*lichen circumscriptus*—Dutt). 9. *pāṣāṇagardabhā*— mumps, parotitis. 10. *panasikā*— a hard, excessively painful boil in the ear. 11. *jālagardabhā*— a kind of St. Anthony's fire, there is light swelling on the skin with heat and fever. 12. *irivellikā*— Carbuncle on the head. 13. *kakṣa*— a painful abscess in or near the armpit. 14. *gandhamālā (gaṇḍamālā ?)*— a similar abscess on the skin. 15. *agnirohiṇī*— painful boils in the armpit, causing internal heat and fever and burning like flaming fire; these cause death after 7, 10, 12 or 14 days (acute abscess according to Dutt). 16. *cipyā*— nail-abscess, *onychie.* 17. *kunakhā*— Psoriasis on the nails. 18. *anuśayī*— a deep abscess on the foot. 19. *vidārikā*— lumplike abscess in the groins and armpit. 20. *śarkarārbuda*— an open cancerlike abscess from which a fluid appearing like a mixture of honey, butter and fat flows; the abscess then dries up and becomes hard, thereupon a bad smelling liquid of varied colours suddenly comes out with blood. 21. *pādadārī*— cracking of the foot caused by walking. 22. *kadara*— a hardening of the foot caused by wound with thorns and the like. Corn on the foot. 23. *alasa*— a painful tumour between the toes (" wet corn on the foot "– Dutt) 24. *indralupta*— falling of the hair, baldness. 25. *dāruṇaka*— scales on the head (" tinea versicolor of scalp "–Dutt). 26. *arūṃṣikā*— favus. 27. *palita*- immature grey hair. 28. *mukhadūṣikā*— pimples on the face of young people. 29. *padminīkaṇṭaka*— a kind of tetter. 30. *jatumaṇi*— hairy mole. 31. *maśaka*—black warts. 32. *tilakālaka*—dark mole. 33. *nyaccha* — liver-spot. 34. *vyaṅga*— brown mole on the face. 35. *nīlikā*— black mole on the face or on the body. 36. *parivartikā*— constriction of the foreskin. Phimosis. 37. *avapāṭikā*— Spannish collar, paraphimosis. 38. *niruddhaprakāśa*—constriction of the urethra. 39. *saṁniruddhaguda* —constriction of the rectum. 40. *ahipūtana*— Erythem or wound in the anus of children. 41. *vṛṣaṇakacchu*— itching eruption on the scrotum. 42. *gudabhraṁśa*— prolapsis of the rectum. 43. *śūkaradaṁṣṭraka*— a kind of erysipelas, redness of the skin with itching and fever (Su 2.13; MN 321–37; AS 6.36; AHr 6.31; Vang 70 ff.; Bhāv 2.4.63 ff.; cf, Car 1.17).

The treatment consists particularly of powdering and smearing the skin with various pastes and ointments, in many cases *e.* g. in

corn on the foot and the abscess *vidārikā*, an operation is to be resorted to, or cauterizing and branding of the diseased place. Nourishing and perspiring remedy, nasal remedy, dressing, blood-letting, medicines are also recommended. In the prolapsis of rectum (*gudabhraṁśa*) one should warm the anus, apply oil to it, then again push back the prolapsed part and perform dressing with a leather perforated in the middle; the anus is then to be fomented very often. A rat whose intestines are taken out serves as a fomenting medium (Su 4.20; AS 6.37; AHr 6.32; Vang l. c.; Bhāv l. c.).

§ 68. **Leprosy and allied Skin-diseases :—** By *kuṣṭha*, a very dangerous skin-disease causing the most wretched deformation— the so-called black leprosy is in general to be understood. According to the Smṛtis, sinners of the highest grade are punished with *kuṣṭha* in their future birth[1]; therefore, the *kuṣṭhin* is incapable of inheriting[2] unless he has practised penance in order to remove the sin[3]. In the medical literature, however, *kuṣṭha* appears mostly to have a wider meaning. In the Bower MS, Hoernle has always translated it as "skin-disease ". The following are mentioned as causes : food and drink that are injurious or mutually unsuitable (e.g. milk with fish)[4], suppression of vomiting and of natural excretions in general, physical exercise or excessive heat after a rich meal,a cold bath after experiencing heat, fatigue or anxious excitation, sexual intercourse while having indigestion, mischief against a Brāhman or a spiritual teacher and others, also sins made in an earlier birth. The following are the preliminary signs : the skin appears glittering and rough, there is excessive perspiration or no perspiration, decolourization, heat and itching of the skin, numbness of certain parts of body, exceedingly strong painfulness of wounds or abscesses, quick aggravation and slow cure of the same and of a rough place remaining after the cure, dark colour of blood, goose-skin, red eruption, pain, weakness etc. Usually 18 forms of *kuṣṭha* are distinguished, and are divided into 7 major and 11 minor forms; in particulars, however, the enumerations differ. According to Mādhava the following are the major forms : 1. *kāpāla* — with black or reddish, dry and rough spots like potsherd (*kapāla*), acute pain, very dangerous. 2. *audumbara*— the spots or boils are like a fig (*udumbara*) are accompanied by pain, heat, redness and itching, the hair on the body become brown. 3. *maṇḍala*— the spots are white or red, hard, wet, glittering, circular, coherent, scarcely

curable. 4. *ṛkṣajihva*— the spots are rough, red on the edges, dark in the middle, painful, formed like the tongue of a bear (Ṛkṣajihva). 5. *puṇḍarīka*— the spots are bright red on the edges red in the middle, elevated, like a red lotus-flower. 6. *sidhma*— the spots are white or coppercoloured, small, giving dust if rubbed, appear mostly on the chest and resemble the blossom of gourd. According to Dutt, Pytiriasis, a kind of Herpes with dustlike scales is meant. 7. *Kākaṇa*— resembles in colour the seed of Kākaṇantikā (*Abrus precatorius* that is black in the middle, red at the edges), suppurates and aches violently. This form is incurable. While these seven major forms can at least be related for the most part to real leprosy, the eleven minor ones are apparently related to the most varied other skin-diseases. 8a. *ekakuṣṭha*— the skin is sweatless, the spots are big and appear like scales. 8b. *carman*— the skin is felt rough like that of an elephant. The former disease is Ichthyosis according to Dutt, the latter Hypertrophy of the skin. 9. *kiṭibha*— dark coloured scars, felt rough and hard, Keloid according to Dutt, that exists in compact rolls arising mostly from the thickening of the skin. 10. *vaipādikā*—violently painful cracks of hands and feet, Psoriasis on foot according to Dutt. 11. *alasaka*— the skin is covered with itching red snobs, a kind Herpes. 12. *Dadrumaṇḍala*— itching, red, elevated spots. According to Dutt ringworm is hereby meant, but this has nothing to do with a disease of the head-skin. 13. *carmadala*–the skin is red, painful, itching and suppurated vesicles are formed that are sensitive to touch. Impetigo. 14. *pāmā*—tiny but numerous vesicles accompanied by discharge, itch and burns. Eczema or wet tetter. 15. *Kacchu*— similar painful scraping with violently burning pustules on the hands and buttocks. 16. *visphoṭa*— dark-red swellings with thinner skin. Boils. 17. *Śatāru*— red or darkcoloured numerous abscesses with heat and pain. Furuncle. 18. *vicarcikā*— itching, dark, severely wet spots or boils. Psoriasis (according to Dutt) or wet tetter. Further divisions depend upon the place of the disease in one of the seven elements of the body; the forms staying in the skin, blood or flesh are only curable. In fat particularly there is lameness of hands, inability to walk, decay of limbs, spreading of wounds from one part of body to the other. In marrow and bones there is prolapsis or decay of nose, redness of eyes, maggots are formed in the wounds,the voice is choked. If present in the *śukradhātu* of the father and in the menstrual blood of the mother, the leprosy is transferred to both the offsprings.

Generally *kuṣṭha* is fatal if there are maggots, thirst, heat and weak digestion, if all doṣas are deranged, if abscesses occur and discharge, if the eyes are red, the voice is hoarse and if medicines are ineffective (on account of weakness). According to Su 2.5 *kuṣṭha* is the worst of all diseases and one who dies due to that is again attacked by it in the future birth. *Kuṣṭha* is also contagous like fever, consumption, opthalmia and the epidemic diseases ("small-pox and the like"–comm.) by constant contact, breathing together, eating together, lying or sitting together, clothes, garlands and ointments. The expansion of *kuṣṭha* from skin to the remaining elements of the body is compared with the gradual expansion of the roots of a tree on the earth. The most numerous recipes for *kuṣṭha*, especially the most varied decoctions with butter and oil are meant for internal as well as external treatment. Generally an emetic should be used once in a fortnight, a purgative in a month, a nasal remedy every third day and blood-letting every six months (AHr 4.19.96 = AS 4.21.120 = Su 4.9.43 = Vr 51, 138). The patient should also keep diet, should practise pious ceremonies and penance, should keep short hair and nails, should avoid overexertion, intercourse with women, flesh and spirituous drinks; then he will be cured (Car 2.5; 6.5; Su 2.5; 4.9; AS 3.14; 4.21; AHr 3.14; 4.19; MN 294–305; Bhāv 2.4.18 ff.; Vaṅg 647 ff.; Vṛ 51.).

Śvitra— " white leprosy " is frequently mentioned along with *kuṣṭha* as minor disease which occurs in subsequent births as a punishment for minor misdeeds[5]. Closely connected or identical with this is *kilāsa*, already coming in the Atharvaveda as a disease characterized by white and grey spots and referred as a white leprosy *(śvetakuṣṭha)* by the commentators[6]. According to Dutt (61) leucoderma is meant by *kilāsa* in medicine. Probably, however, the white (smooth or anesthetic) leprosy is at the same time meant thereby, since both the diseases are frequently met with in India and are so difficult to distinguish that at the last census special instructions had to be given on that point[7]. According to Susruta, *kilāsa* is differentiated from *kuṣṭha* by the fact that the former rests only in the skin and is without discharge. According to AS, AHr, MN, *svitra* or *kilāsa* can invade blood, flesh and fat and is then worse successively. The disease is curable if the hair on the body are not white (but black), the spots are not big and are not confluent or appear like burnwounds.

Otherwise it is incurable especially if it appears on the genitals, palms or lips (Su 2.5.13; AS 3.14; AHr 3.14.37-41; MN 202-5). The treatment is similar to that for *kuṣṭha*. Many recipes are used for both the diseases (Vr l. c.; Bhāv 2.4).

According to Dutt, leprosy is meant by *vātarakta*, *vātaśoṇita*, *vātāsṛj*. *Vātarakta* is caused by corrupted blood that immediately runs in the feet and is towed there. The blood is corrupted by hot food and drink and other defects of diet, sleep by day, long walk in heat, want of movement, grief, anger etc., particularly if one lets hang the legs from a carriage or a riding animal (AS, AHr). According to Susruta, there is in the feet pain, pricking, dryness, numbness or excessive burning, or they only itch, but are white, cold and swollen. According to AS, AHr the preliminary signs of *vātarakta* are similar to those in *kuṣṭha*. There is, moreover, fatigue, looseness of limbs, itching, convulsion, joint-trouble, pricking, heaviness and numbness in the knees, legs, thighs, hips, shoulders, hands, feet and joints. These signs come and go. *Vātarakta* is first *uttāna*, i. e. confined to the skin, then *gambhīra* " deep " when it catches hold of all the seven elements of the body, so that the limbs grow crooked and the patient becomes lame or limps (Car, Su, AS). In the variety caused by vāta there is severe pain, convulsion and joint-trouble, the tumour is black, the vessels, fingers and joints grow crooked, the limbs are stiff and benumbed and shiver. In blood there is a copper-red painful swelling with pricking in the skin. In the variety caused by pitta there is excessive heat, suppurating abscesses, numbness and delirium. In the variety caused by kapha heaviness, insensibility, coldness of the skin, itching and little painfulness. Many times the ailment spreads over the body after it has reached the ankle-bone and wrist. The disease is incurable if an open wound rises up to the knee or the tumour bursts and suppurates, or vitality and flesh are reduced or if there are other bad complications like sleeplessness, breathlessness, decomposition of flesh, faint, delirium, fever, numbness, erysipelas, crookedness of fingers and toes, lameness, formation of glands etc. The treatment is partly external, partly internal. Many decoctions in butter and oil are especially recommended (Car 6.29; Su 2.1; 4.5; AS 3.16; 4.24; AHr 3.16; 4.22; MN 187-90; Bhāv 2.2; Vaṅg 405-25; Vr 9). From the above symptoms *vātarakta* cannot exclusively be identical with leprosy, but covers also gouty and rheumatic ailments[3], perhaps also other skin diseases.

(1) Visnu 45, 2. (2) Cf. my *Tagore Law Lectures*, 276 ff. (3) Cf. Colebrooke's Digest (London 1801) 3, 304 ff. (4) This belief exists in India even at present. cf. Census of India 1891,23,366. (5) Manu 11.51, Visnu 45.13. (6) Cf. Zimmer, l. c. p. 391, Bloomfield, SBE 42, 266. (7) Cf. e. g. Census of India, 1891, 16, 305. " The Indian Leprosy Commission " published in 1889-90 a Report on the present position of leprosy in India. (8) Cf. Wise, *Commentary*, p. 266 note. Avinashchandra Kaviratna's Caraka translation, p. 217 note.

§ 69. **Inflammations and Tumours:**—By *śotha*, *śvayathu*,*śopha*, " swelling " every marked swelling of the skin on any place is to be understood. According to Car 1.18 there are three or seven varieties of *śotha* resulting from the dosas or their combination, or two varieties according as they are originated from internal or external (*āgantu*) causes. External or accidental causes are : wounds of every kind, contact with leaves, fruit or juice of Bhallātaka (*Semecarpus anacardium*)[1], stinging insects (*śūka*)[2], poisonous plants, the sweat, skin or urine of poisonous animals, the biting and wound by the horns or claws of poisonous or non-poisonous animals, sea-water, poisonous wind and burning wounds. Internal causes of *śotha* are : improper use of medicines, severe form of vomiting, cholera, leprosy, abortion and other diseases, injurious food and drink etc. *Śotha* is dangerous if it appears in the middle of the body, or is spread all over the body, fatal if it appears on half of the body or spreads upwards. The case is also hopeless if there is breathlessness, thirst, vomiting, fever, weakness, loss of appetite, hiccup, diarrhoea and cough, if the *śotha* spreads from the feet in men and from the mouth in women, or from the anus in both the sexes, if it is old, has its place in belly, throat or in a vital place, is extensive or hard, or attacks children, old people or the weak. According to Caraka local inflammations and swellings on the tongue (*upajihvikā*, *adhijihvikā*), on throat and larynx (*galaśuṇḍī*, *galagaṇḍa*, *galagraha*), on gums (*upakuśa*), on stomach (*udara*, *gulma*), St. Anthony's fire (*visarpa*), red ulcers or boils (*piḍakā*), copper-red and painful boils (*alajī*, also Vedic) and others also belong to *śotha*. The treatment is more internal than external. The diet is also to be regulated carefully (Car 1.18; 6.12; Su 4.23; AS 3.13; 4.19; AHr 3.13; 4.17; MN 243–8; Bhāv 2.3; Vr 39; Vaṅg 561–74).

By *śopha*, Su, AS, AHr (cf. also Car 6.25) mean inflammations; suppurating growth, apparently what is called *vraṇaśotha* i. e.

a swelling consequent to pus formation in later pathology (MN, Vaṅg, Bhāv), cf. § 78. There are six varieties of *śopha* or *vraṇaśotha*, which depend upon the doṣas, blood or external causes, and are distinguished by their colour, consistence, painfulness and kind of development. There are further three stages of an inflammation of which the unripe (*āma*) is recognised by little heat and painfulness, coldness, hardness and little elevation of the tumour and unchanged colour of skin. In the ripening (*pacyamāna*) inflammation there is violent pain like that by pricking of a needle, ant or scorpion, pricking by knife, stroke of a club, burning or cauterizing and the like, the patient finds no rest in standing, sitting or lying, the tumour gets more elevated like a blown leather bag, the skin becomes pale, there is fever, heat, thirst and loss of appetite. In the ripe (*pakva*) condition the pain relaxes, the skin is whitish, there is diminished swelling, wrinkles appear on the skin, the skin springs up, the tumour can be pressed in by fingers, but again gets elevated, the above-mentioned phenomena cease and the appetite returns. One should first press the inflammation by fingers, then extract blood by means of leeches and the like, then should apply plaster to it, fourthly cut it up, fifthly apply purifying substances, sixthly healing substances, lastly remove the disfigurements (Su 1.17 = Vr 44). Before the operation the patient should have eaten something, so that he may not faint, and if he is accustomed to drink or cannot tolerate the pain, he should be given a strong drink, so that he may not feel the knife in the intoxication (Su 1.17; AHr 1.29). The avoidance of an operation in a ripe abscess leads to the result that the pus seeks a way out forcibly and forms a fistula, cf. § 77. On the other hand, the opening of an unripe abscess causes severe loss of blood, disturbance of flesh, arteries, sinews etc. and other bad complications (Su 1.17; AS 1.38; AHr 1.29; MN 265–7; Vr 44; Bhāv 2.3; Vaṅg 606 ff.).

(1) According to Dutt, *Mat. Med.* 141 the cauterizing juice of Bhallataka is used even at present for curing artificial wounds or scars.
(2) These *suka* were employed also as stimulants when one applied them to the penis. Other similar stimulants were, therefore, called *suka*, cf. *Kamasutra* 369. The 18 *sukadosas* pretendedly arising from these *suka*, inflammations and abscesses on the genitals, of which four are incurable, form a special subject of Indian medicine (Cf. Su 2.14; AS 6.38 f.; AHr 6.33 f.; MN 289-93; Vang 645 ff.; Vr 50.).

§ 70. **St. Anthony's fire, Boils, Nettle-rash, Measles :—** The *visarpa*, *parisarpa*, " St. Anthony's fire, Erysipelas " (cf. Vedic

visarpaka, SBE, 42, 531, 601) is also compared with leprosy (*kuṣṭha*) and the name shows that it is spread over on all parts (*sarvato visarpaṇāt* or *visaraṇāt*, *vividham sarpati*). According to Caraka the causes of its origination are excessive use of salt, sour, pungent, hot fluids and other defects of diet, also wounds, poisonous wind etc. By vāta, the place affected by *visarpa* is brown or reddish, swollen, extremely painful, and if one does not take proper steps against it, it is covered with quickly bursting, small, reddish or dark pustules, there is also constipation and retention of urine. By pitta, the affected part is copper-red, green, yellow, blue, black or red, and pustules are formed which are excessively burning and quickly ripening. By kapha, the place is swollen, not very red or painful, the pustules ripen slowly, the discharge is white and bad smelling. By vāta and pitta, the part appears like extinguished coal or extremely red, the pustules resemble blisters. This form is called *agnivisarpa* or *āgneya*. By kapha and pitta, the place is covered with red, yellow or whitish vesicles, and is dark, burning, deeply suppurating and without discharge. This is the incurable form *kardamavisarpa*. By kapha and vāta, a group of very painful glands (*granthimālā*) is formed, so it is called *granthivisarpa*.By all doṣas the disease affects all limbs and all elements of the body and shows all the above signs. This form is incurable. *Granthivisarpa* is incurable if the following complications occur :— fever, diarrhoea, hiccup, breathlessness, vomiting, faint etc. *Agnivisarpa* is also incurable if it quickly affects the major parts and brings forth numbness, sleeplessness or sleepiness, uneasiness, gouty pain in the joints. The first three forms are curable; however, unfavourable signs accompanying them are also mentioned. The treatment of curable forms should commence with emetics, fasts, purgatives, blood-letting and the like, external treatment (*kriyā bāhyā*) with ointments, cold poultices, plasters etc. should follow only afterwards. According to the above descriptions carbuncles and other abscesses are also to be understood by *visarpa* besides St. Anthony's fire (Car 6.21; Su 2.10; 4.17; AS 4.20; AHr 4.18; MN 309–14; Vr 54; Vaṅg 689–95; Bhāv 2.4).

The *visphoṭa*, *visphoṭaka* " boils " are already referred to as a form of leprosy (*kuṣṭha*, § 67). They are also mentioned under *kṣudraroga* (§ 67) in AS 6.36, AHr 6.31 as very painful pustules which are even worse than small-pox. According to Mādhava, they resemble

the blisters, are related to fever, proceed from blood and pitta and appear either only on one place or all over the body. By all doṣas they are pressed in the middle, elevated on the edges, hard, without much pus, there is burning, redness, thirst, semi-consciousness, vomiting, faint, pain, fever, delirium, shivering and sleepiness. This form is incurable. Red pustules that appear like guñjā seeds, i. e. red with a black spot or like corals, are also incurable. The treatment is, as in the case of *visarpa*, first internal, then external. In recipes also *visarpa* and *visphoṭa* are frequently mentioned together (MN 314–16; Vr 55; Vaṅg 695–99; Bhāv 2.4).

Śītapitta, udarda— nettle-rash according to Wise and Dutt, is apparently foreign to the older pathology, yet AS 2.2, AHr 2.2 mention a form of the same connected with a cold eruption and *udarda* in fever. The disease is caused by cold wind and begins with thirst, loss of appetite, nausea, feebleness, heaviness in limbs, redness of eyes, whereupon an elevation resembling a bite of a wasp is formed on the skin with itching, pricking, vomiting, fever and heat. The disease is especially called *udarda* (erysipelas, St. Anthony's fire) if it occurs in cold season, is due to kapha and is characterised by elevations that are itching, round and pressed in the middle. *Koṭha* (*urticaria evanida*—Dutt) an eruption with many, round, itching, red spots, arises especially from insufficient or wrong application of emetics in the case of corrupted stomach. If occurred repeatedly, this ailment is called *utkoṭha*. The treatment of this disease which is apparently considered as a minor one is similar to that of *visarpa* and *kuṣṭha* (MN 305 f.; Vr 52; Vaṅg 677–9; Bhāv 2.4).

The measles that often appear at present in India as epidemic and claim a big mortality are almost unknown to the older medicine. Caraka mentions the *romāntikā* briefly in the chapter on *śotha* (6.12.88) where he describes them as small spots spreading on the whole body accompanied by fever, heat, thirst, itch, loss of appetite and nausea. They are omitted in his list of diseases (1.19). According to Mādhava who treats them as a kind of small pox, the *romānti* are small red dots with elevation equal to hair-roots. Accompanying signs are cough and loss of appetite, the fever comes beforehand. In the recipes also the measles appear along with small pox (MN 318; Vr 56; Bhāv 2.4; Vaṅg 701).

§ 71. **External and Internal Abscesses**:— By the oft mentioned ailment *vidradhi*, *vidradhikā* (Vedic *vidradha*) which also comes as a consequence of diabetes, various abscesses and inflammations are meant. According to Car 1.17.95 the name is derived from brisk burning or demolition (*śīghravidāhitvāt*). There are external and internal *vidradhis*. Caraka identifies the latter with *granthi* "growth, deep seated abscess" that has its place in heart, lungs, liver, spleen, stomach, kidney, navel or groins. Ripe abscesses empty their contents from the mouth if their place is in the upper half of the body and from the anus if in the lower half of the body, from both sides if their place is in the navel. Those in the heart, navel or bladder or due to three dosas are fatal. In all *vidradhis* the pain is very acute as by cutting with a knife, by throw of a spear or by burning with fire. In the ripening condition the pain is like the stinging of a scorpion (Car 1.17). Caraka describes other *vidradhis* and *granthis* in the chapter on *sotha* (6.12) :— *vidradhi* on the palate with burning and redness of flesh, *dantavidradhi*— a tumour on the gums, *granthi* which must be cut out lest it may recur, *arbuda* which are of similar quality and are to be treated like *granthi* etc. According to Su, MN, *vidradhi* is a dangerous, deep-rooted painful, round or oblong tumour. By vāta it is black or red, of changing size, extremely painful, grows and ripens slowly, the discharge is faint-coloured. 2. By pitta, its colour is like that of a ripe fig or dark brown, it is accompanied by fever and heat, grows and ripens quickly, the discharge is yellow. 3. By kapha, it is (big) like a dish, whitish, cold, glittering, not very painful, grows and ripens slowly and itches, the discharge is white. 4. By tridosas the colour, pain and the pus are of different kinds; this form is incurable. 5. By wounds the signs are as by pitta, but by neglecting the wounds, there occurs fever, thirst and heat. 6. By blood the tumour is surrounded by small black dots, is dark-coloured, causes violent burning and pain, otherwise shows similar signs as by pitta. The internal *vidradhis* are to be distinguished from the external *vidradhis*. The internal *vidradhis* correspond to the abscesses in heart etc. described above according to Caraka. If they burst from upwards (from the mouth) they are fatal. *Makkalla*, the abscess of the confined woman due to retention of blood is also here considered, cf. § 49, and the difference between *gulma* (cf. § 54) and *vidradhi* is explained. The former tumour does not ripen, because it does not contain flesh and blood, the latter ripens, i. e. suppurates, because it contains

much flesh and blood. For *vidradhi* the application of leeches and mild purgatives, plasters and poultices and various medicines etc. are recommended (Su 2.9; 4.16; AS 3.11; 4.15; AHr 3.11; 4.13; MN 260–5; Vr 43; Bhāv 2.3; Vaṅg 600–6.).

§ 72. **Growths, Tumours, Scrofulous Tumours, Goitre** :— The *granthi* and *arbuda* mentioned in § 71 are besides spoken of mostly in conjunction with scrofulous and other swellings. According to AS, AHr *granthi* " growth " is a round and big tumour. If fleshy, it is glittering, big, hard. If fatty, it is wet, movable and lets out tough, copper-coloured, white or black fat (lipoma ?). If bony, it is caused by fracture of bone, and is deep or superficial. If vascular, it is free from twitching and pains. If caused by a wound it is connected with heat and itching. *Granthis* that are big hard, movable and occur in a major part, in throat or in bowels, are incurable.

The *arbudas* are, according to AS, AHr, bigger than the *granthis*, according to Suśruta round, firm, absolutely painless, big, deep-rooted, of slow growth, without pus and can appear on any part of the body. There are six varieties of *arbudas* two of which are incurable : one pertaining to blood (*śoṇitārbuda*) in which a considerable discharge of spoiled blood takes place and the other pertaining to the spoiled flesh (*māṁsārbuda*) in which there arises a painless, stone-hard tumour.

If a firm, round or elongated tumour occurs on the joints of jaws, armpit, the collar-bone or the arm, or in the neck, or in the cervical region by the accumulation of fat and phlegm, around which other tumours of the size of a myrobalan or like eggs of fish are formed, it is called *apacī* (Vedic *apacit*)[1] on account of the swelling (*caya*). These small tumours cause itching and little pain, discharge a liquid when they burst, disappear, then new ones are formed. If the disease has lasted for a number of years, it is scarcely curable (Suśruta). Closely connected or identical with this is *gaṇḍamālā* " chain of glands " consisting of numerous small tumours (*gaṇḍa*) of the size of jujube or myrobalan that are formed in the armpit, on the shoulder, neck, cervical region or in the groins, cause little pain, ripen slowly, disappear, but always recur for a long time, and are incurable if there is cold, pain in the sides, cough, fever and vomiting (MN, AS, AHr). Evidently scrofulous tumours are meant by these.

Connected with *gaṇḍamālā* is *galagaṇḍa* " throat-tumour ", i.e. goitre which frequently occurs in Terai even at present[2]. A big or small tumour that hangs from the neck like testicles is called *galagaṇḍa*. If fatty, the goitre is smooth, heavy, whitish, bad smelling, itching and scarcely aching, hangs down like a cucumber with small root, diminishes or grows just like the body, the mouth glitters, the voice is reserved. The ailment is incurable if the patient breathes with difficulty, the place is soft, the goitre is already an year old, the patient is exhausted and is hoarse (Su, MN). In AS, AHr elephantiasis and fistula are added here in place of goitre.

Immature *granthis* are to be treated like *śotha* (cf. § 69), mature ones are to be pressed and to be cleansed and then to be cured like wounds. For *arbuda* similar rules as for *granthi* are applicable (Vr 41, 26, 34). Moreover, operations with knife, cautery branding, application of leeches, plaster and various medicines are also recommended. The extirpation must be complete, lest the tumour would recur. *Apaci* can be cured by applying an ointment formed by a mixture of ash of mustard leaves and other things with goat's urine, emetic and purgative are to be used internally. Fumigation, blood-letting from the wounded place, branding of the same, sneezing remedy etc. are also recommended as for *gaṇḍamālā*. On similar smearing and blood-letting in the Vedic medicine in the case of *apacit*, see Kauśika sūtra 30.16 (Caland); Bloomfield, SBE 42, 504. For goitre various lukewarm poultices and plasters, blood-letting, nasal remedy etc. are to be applied. Internally cow-urine or she-buffalo urine with different additions and other medicines. Steps can also be taken for the excision of tumour (Car 6.12; Su 2.11; 4.18; AS 6.34; AHr 6.29; MN 251–58; Vr 41; Bhāv 2.3; Vang 582–92).

(1) Cf. Bloomfield, *American Journal of Philology*, XI, 320 ff., SBE 42, 504. (2) Chevers, l. c. p. 361.

§ 73. **Elephantiasis :—** This disease, known by the deformed swelling, appears in the law-books as a punishment by destiny for the breach of a vow for chastity in an early birth[1]. As the name denotes, *ślīpada* chiefly arises on the foot; because the doṣas with an excess of phlegm penetrate in the lower half of the body, beginning

with the groins and upper thigh, affect the flesh and blood and reach the foot in course of time, where they gradually bring about a firm swelling (AS, AHr). If caused by vāta it is hard, black, rough, the skin cracks, there is pain without occasion, the pain is violent and there is fever. By pitta the *ślīpada* is yellowish, a little soft, accompanied by fever and heat. By kapha it is smooth, whitish, heavy (*bhārika* " forming a load ") immovable, big, oversaturated with outgrowth of flesh and painless. *Ślīpada* is incurable after one year and if it is excessively big, resembles an anthill and dribbles excessively etc. "According to some authorities" *ślīpada* arises, besides on the foot, on hands, nose, lips and ears, and also on the eyes and penis. It occurs especially in such regions as contain stagnant waters, are swampy and cold in all seasons. The surgeon should open a vein above or below the ankle-bone according to the tridosas, or on the big toe. Different plasters and smearings are then described, heat is also to be applied, the patient should fast or drink castor oil with cow-urine for a month or take an enemeta; in extreme cases the swelling should be branded (Car 6.20.93; Su2.12; 4.19; AS 6.33; AHr 6.29; MN 258-60; Vr 42; Bhāv 2.3; Vang 594-600). The elephant-foot and similar monstrously big tumours on the scrotum as well as the elephantoid swelling are met with even at present in India especially in swampy regions².

(1) *Visnu* 45.29. (2) Chevers l. c. 263.

§ 74. **Swollen testicles, Hernia, Hydrocele** :— The general expression *vṛddhi* " growth " seems to mean every diseased swelling of the scrotum, while the cognate *vardhma*, *vardhman* (*vradhna*, *bradhna*, *bradhma*) which is held by Aruṇadatta as fully synonymous, is used in the restricted meaning " Hernia "; cf. Bhāv 2.3; Vang 580. However, in Car 1.18.36 both the readings *vṛddhi* and *bradhna* are found in the description of the disease in which the deranged vāta comes in the testicles from the groins as a result of swelling and pain; cf. also Bhāv 2.273. The same disease appears to be described in Car 6.12. 89 f. where mention is made of testicles swollen by vāta which protrude out the intestines and again are replaced and are to be operated; this is apparently hernia. According to Vang 580 a painless swelling of the testicles is called *kuraṇḍa*. According to MN 248–50=AHr 3.11=AS 3.11=Vang 574ff=Bhāv 2.3 the deranged vāta penetrates

into the scrotum from the groins, causing swelling and pain, and brings about *vṛddhi* in the testicles. There are seven kinds of this ailment according as it is due to one of the three doṣas or due to blood, fat, urine or the descending bowels. By urine *vṛddhi* is caused by habitual retention of urine, is painful and soft and is shaken like a leather-bag filled with water while walking, urinary diseases also occur, and a round elevation is formed below the testicles. This seems to be hydrocele (Wise). The incurable disease *antravṛddhi* (Hernia) is caused by the entrails. If vāta is aggravated by food that disturbs it, by cold baths, suppression or provoking of natural excretions, carrying loads, long journeys on foot,dislocations and other disturbances, it spoils a piece of small intestines and drives it downwards from its original place, and thus causes a growthlike tumour in the groins. If the tumour is not treated, the vāta causes a painful swelling of the scrotum that goes back inside with noise if pressed and comes again at the close of the pressure. According to Su 2.12.6 the swelling of the scrotum is oblong and resembles a bladder.

In all kinds of *vṛddhi* riding, physical exertion, cohabitation, suppression of natural excretions, movements, excess in eating, fasts and heavy food should be avoided. In ripe tumours an incision should be taken; a fatty tumour should be wrapped with a piece of cloth and then, after encouraging the patient, should be cut up with a scalpel (*vṛddhipattra*) sparing the testicles and the spermatic cord, and the fat should be taken out, then the wound should be smeared with sulphate of iron and rock-salt, dressed or sewn and treated with oil. In hydrocele a piece of cloth should similarly be laid around and then, as in dropsy (cf. 8.54), an incision should be taken below the spermatic cord with a *vrīhimukha* (Trocar), the fluid should be tapped with a tube and then dressing should be made. Hernia on scrotum is incurable. On the other hand, hernia in the groins should be treated with emetics, smearing, oily enemeta and the like, eventually should be branded with a halfmoon-shaped (*ardhenduvaktrā*) red-hot iron (Su 4.19; AS 4.15; AHr 4.13; Vr 40; Bhāv 2.3; Vang 576–81).

§ 75. **Other Diseases of the Male Organ :—** Along with *vṛddhi* *upadaṁśa* is mentioned. This disease of the penis is caused by wound of the same at the coitus with hands, nail or teeth[1], neglect of washing

after cohabitation, or use of foul water for washing, intercourse with a woman who is menstruating, is unclean or is suffering from some female disease, forced intercourse, use of *śūka* (cf. § 69) and other stimulants and the like. The tumours or pustules caused by it are black, fig-coloured, white etc. according to the doṣa responsible for it. If the flesh on the penis is vanished, corroded by maggots so that the testicles only remain, then the case is hopeless. One who does not take any steps immediately after the beginning of the disease, but continues sexual intercourse, has his penis demolished by tumour, maggots, heat and pus, and he dies. First the use of oil and warmth is recommended, then a vessel in the middle of the penis is opened or a leech is applied and purgative and emetic are given; an enema should be given to feeble patients. According to the kind of the disease, various warm and cold smearings, washings and poultices are applied. The surgeon must try to prevent the discharge of pus and to remove quickly the accumulated pus with knife (Su 2.12; 4.19; AS 6.38; AHr 6.33; Vr. 49; Bhāv 2.4; Vaṅg 639–43)

A disease coming in MN, Bhāv, Vang is *liṅgavarti* or *liṅgārśas* (" Penis-abscess "), a growth on the genital that resembles a cock's comb, with abscesses that are oblong, occurring on one another, phlegmatic and painful and are scarcely curable. The tumour is to be completely cut out and branded, or it is to be rubbed with an extract of *Berberis asiatica*, realgar and other medicines (MN 288 ff.; Bhāv 2.4; Vang 639-43). According to Dutt, *Nidāna* 169 f., *liṅgavarti* is syphilis and *liṅgārśas* is warts. Häser has identified *arśas* coming in Su 2.2 with syphilis. It is caused by foul flesh and blood in the penis, begins with itch, then a wound occurs on it if it is scraped, puffed outgrowths caused by foul flesh and discharging phlegmatic blood are formed within (in the glands-Ḍallaṇa) or on the external skin, and they demolish the penis and potency. Similar bad smelling outgrowths in the vagina stop menstruation. Apparently the same disease is meant by *arśas*, *liṅgārśas*, and *liṅgavarti*, but whether syphilis is meant is equally doubtful even though in the Vedic names of the disease which Bloomfield[7] relates to syphilis, the above symptoms (cock's comblike etc.) could be related to syphilitic Condylomata.

The identification of " syphilis " with the disease *phiraṅga*, *phiraṅgaroga*, *phiraṅgāmaya* " the Franc disease " is certain which,

however, is mentioned in the works of the 16th century, especially in Bhāv 4.50-2[3] along with boils and the small pox. There its name is explained by the fact that it frequently occurs in the land of France (*phiraṅgasaṁjñake deśe*) i. e. in Europe. It is a gland-disease (*?gandharoga* for *gaṇḍaroga?*) that is caused by physical contact with a *phiraṅgin* (European), (and particularly–comm.) by intimate intercourse with a *phiraṅgiṇī* (European woman), and belongs to the diseases originating from external cause *(āgantuja)*. 1. External *phiraṅga* resembles the vesicular disease (*visphoṭa*, cf. § 70) and causes little pain. If the vesicles burst, they are to be looked upon as wounds and are easily curable. 2. The internal *phiraṅga* occurs in the joints, causes pain and swelling like rheumatism and is difficult to cure. 3. The external-internal causes the signs of 1 & 2, is painful, very much protracted and very scarcely curable[4]. Bad complications in *phiraṅga* are : thinness, loss of vitality, depression of the nose, indigestion, wasting and crookedness of bones. External *phiraṅga* is curable if it is new and free from complications. The internal is scarcely curable, external-internal is incurable if the patient has become weak and if there are complications. As the chief remedy for *phiraṅga*, mercury[5] *(pārada, karpūrarasa)* is recommended, especially internally, e. g. in a pill with wheat which is to be swallowed in without allowing to touch the teeth, also externally as smearing substance, or when it is fully pulverized between the hands. Saltish and sour things should not be eaten after internal use, also exercises, heat, long journey on foot and especially sexual intercourse should be avoided. A further specific medicine for *phiraṅga* is *cobacīnī*, *copacīnī*, a well known remedy for syphilis in India even at present which, according to Bhāv 1.1 is also called *dvīpāntaravacā* apparently from its foreign origin. This is sārsāparillā, the root of smilax which must have come to the Portugese in Goa about 1535 A. D. as a remedy against *Lues* through Chinese traders,[6] and is known in Europe only since the 16th century. The Berlin MS in which *phiraṅga* is described,[7] appears to be an excerpt from Bhāv.[8] The European origin of *phiraṅga* cannot, therefore, be doubted.

Impotency, *klaibya*, is divided into four kinds according to Car 6.30, in five kinds according to Hārīta 709, 359, in six kinds according to Su 4.26, and in seven kinds according to Bhāv 3.2. It is either hereditary or gained by use of sour, saltish, dry or useless

food, excessive water-drinking, fasts, diseases or wounds of penis, castration, chastity, mental causes like dejection, anxiety, intercourse with disagreeable or sick woman, sexual extravagance, decrepitude etc. The Indian law-books also refer to impotency since it forms an obstruction for marriage and effects no right of succession.[9] Nārada 12.11-18, therefore, mentions fourteen kinds of impotency, seven curable and seven incurable, among the latter especially natural impotency as well as that caused by castration. The remedies for regaining and strengthening potency (*vājīkaraṇa, vṛṣya*) form one of the eight chief subjects of medicine. Already in the Bower MS a special chapter is devoted to them which contains a recipe for enabling to enjoy a hundred women in a day (Bower MS 2.830-32). Such remedies are recommended especially for polygamists (Su 4.26.5).

(1) Cf. *Kamasutra* 124 ff. (2) SBE 42,341,561. (3) Collated with the Tubingen MS written in 16th century. (4) The definition of 2 and 3 supplied from the MS by conjecture. (5) Cf. Dutt, *Mat. Med*, 36-8. (6) Dutt, l. c. 264. (7) Weber, Verz. No. 966. (8) Communicated by letter by Dr. I. Bloch and Dr. Sieg in Berlin; similarly Roth, ZDMG 31, 158. Cf. Bloch, *Eine neuer Beitrag zur Frage der Altertums Syphilis*, Monatsh. f. prakt. Dermatologie 28, 629 ff. (9) Cf. *Recht und Sitte*, 59,63.

§ 76. **Haemorrhoids** :—The *arśas* mentioned heretofore in the sex-diseases, originally connected with ἕλκος, ulcus, denoted certain knots or growths of every kind. Thus Car 6.14.6 (cf. Su 2.2.17) says that some consider, beside the anus, also the vagina, penis, throat, palate, mouth, nose, ears, eye-lids and the skin as the seats of *arśas*. However, in his work this denotation is confined to the *arśas* in the anus. The haemorrhoidal growths which are common everywhere in the Orient (also in Veda, cf. Zimmer, p. 393) and are denoted as fleshy outgrowths, tumours (*māṁsāṅkura, māṁsakīlaka*—AHr 3.7.1 f.), are generally connected with diarrhoea and dysentery (*atisāra, grahaṇī*), because these three ailments are brought about mutually and are due to disorder of digestion (Car 6.14). Therefore, the following appear as the causes of *arsas* :— unsuitable feeding, excess in eating, pungent, sour, salt or hot food, fasts, want of movement, sleep by day, riding, squatting, alchoholism, sexual extravagance, suppression of excretions, grief, anger etc. The preliminary signs are : weak digestion, diarrhoea or constipation, flatulence, fre-

quent eruption, feebleness, thinness, cramps in calf of the leg, giddiness, swollen eyes, depression of limbs, colic, dislike for eating, indigestion, sleepiness etc. (Su, MN, AS, AHr). *Arśas* is either hereditary or acquired, dry or wet. It is usually of six kinds. 1. If caused by vāta, the small growths in the anus become inflated, dry, pricking, dark-red, rough, uneven, hard, resembling different kinds of fruits. 2. If caused by pitta, the *arśas* are red, yellow or black with blue top, like a parrot's beak, or resembling the colour of liver or the mouth of a leech and discharge thin blood. 3. By kapha the *arśas* are white, hard, round, smooth, like kernels of certain fruits or cow's nipples, nearby each other, burst and are not wet, and they itch excessively. 4. If caused by all doṣas, all symptoms are present. 5. If caused by blood the *arśas* resemble the hanging roots of Ficus Indica, corals or *kākaṇantikā* (red with black dot), or otherwise their appearance is as by pitta, but if accompanied by hard stools they discharge a good deal of foul, hot blood, the usual sequelae of bleeding also appear, while the patient becomes pale, feeble and dull. 6. Inherited *arśas* are bad looking, rough, whitish; one affected by them is very thin and weak from his very birth, pale, sad, irritable, suffers from retention of urine and constipation, urinary calculus and gravels and other troubles. In the above five forms there are obstructed, sparing, phlegmatic, painful and bloody stools, urinary troubles, change in colour of the skin, of the nails and other allied signs. The three skin-folds *(vali)* or muscles *(peśi)* in the anus are denoted as the seat of *arśas*. *Arśas* are easily curable if they are in the external skinfold and are not old. They are scarcely curable if they are in the middle skinfold and are an year old. They are incurable if they are in the innermost skinfold and are inherent or are caused by the three doṣas. For the *arśas* on the genitals see § 75. Papillary outgrowths on the skin *(carmakīla)* are also considered as a form of *arśas* (Car 6.14; Su 2.2; AS 3.7; MN 79–89; Vang 139 ff.; Bhāv 2.2).

The haemorrhoids are to be treated according to the symptoms. Thus in diarrhoea the remedies as for diarrhoea caused by vāta are to be applied, in constipation those for *udāvarta*, and in heavy discharge of blood those for haemorrhage (Vṛnda 5.5 f.). Medicines, cauteries, knife and fire are in general prescribed; yet Car 6.14.34-36 points out the dangerousness of the latter three methods which, in case of defec-

tive application, can bring about impotency, tumours, colic and other pains, excessive loss of blood, new formation of growths and even death. Harita, Bhāv, Vang also confine themselves essentially to the numerous recipes of the most varied pills, oil- and butter-decoctions etc. for internal use as well as enemeta, suppository, smearing and poultices. On the other hand Su, AS, AHr exclusively describe the operation of the patient suffering from haemorrhoids who should be in a lying position, tied, held by servants so that he may not wince. He should stretch up the anus wherupon the growth is cauterized or branded. One growth should be taken up after every seven days. Big growths of strong patients are to be excised and then to be branded (Su 4.6; AS 4.10; AHr 4.6; Vṛnda 5; Vang; Bhāv l. c.).

§ 77. **Fistula** :— *Bhagaṁdara*, *bhagadāraṇa*, fistula-in-ano, " crevice in the vagina or the genitals " is caused by riding, squatting, chiefly from causes similar to *arśas* (AS, AHr), and is known by pain on the hips, itching, burning and tumour on the anus (Su). First there appears an abscess, then it expands and forms a fistula (MN). 1. *śataponaka.* By vāta. A reddish, painful abscess occurs on the anus. If it is not cured, it leads to bad suppuration and forms many openings with narrow mouth, from which plenty of frothy discharge comes with needle-pricking and other violent pains. Wind, urine,pus and sperm also come out from these openings. 2. *Uṣṭragrīva*, *Uṣṭraśirodhara.* By pitta. The abscess is red, long and thin like the neck of camel (*Uṣṭragrīva*); it burns the wound caused by it as if fire or cautery were applied to it, the discharge is bad smelling and hot; by neglect of the wound urine, pus etc. come from it. 3. *pariśrāvin.* By kapha. The tumour is whitish, hard, itching, the discharge is tough and phlegmatic; by neglecting it urine etc. come out. 4. *Śambūkāvarta.* By three doṣas. The tumour is of the size of a big toe, the above signs are combined,the discharge is of different colours. 5. *Unmārgin* or *kṣataja.* If a bone is swallowed while eating and wounds the anus while coming out of it in an oblique position, a faecal boil is formed by vāta in which maggots are created that gnaw and perforate the anus, so that faeces, urine etc. come out of these openings. All *bhagaṁdaras* are dangerous; the fourth and fifth kinds are incurable (Su 2.4; AS 6.32; AHr 6.28; MN 284–87; Vang 635 ff.; Bhāv 2.4). The abscesses are to be treated carefully with fasts, purgatives, blood-letting, dressing etc., so that they may not suppu-

rate. If there is suppuration a probe should first be inserted in order to ascertain the nature of the fistula, whether it is open by outside etc. Then an incision should be taken according to the condition, or a cautery or fire-brand should be applied. If there are many openings, an expert surgeon should take a plough cut (*lāṅgalaka*) in the middle, or a half plough cut (*ardhalāṅgalaka*) on one side or the quartering (*sarvatobhadraka*) or the side cut (*gotīrthaka*), then the canals on all sides should be branded (Su 4.8; AS; AHr; Vang; Bhāv l. c.; Vṛnda 48).

Sinus are generally called *gati*, or rather *nāḍī*, *nāḍīvraṇa*, because they lead like a *nāḍī* (reed-vessel) the pus that penetrates inside from an abscess which is ignored, i. e. not squeezed out or cut open and cleansed and tears and pierces the skin, flesh, vessels, sinews, joints, bones etc. They are caused by the doṣas or a foreign body that causes constant suppuration (Su 2.10; AS 6.34; AHr 6.29; MN 282–4; Bhāv 2.4; Vang 631 ff.). A fistula caused by vāta is to be fomented, the suppuration is to be fully cut open, to be smeared with various irritants, or to be filled up and dressed, further to be washed with other substances. Similar procedure is to be followed in sinus caused by pitta and kapha. On the contrary, a foreign body is to be extracted out after incision of the sinus, then the suppuration to be cleansed, the wound to be dressed and to be cured by ointments. If the sinus occurs at a dangerous place, or the patient gets lean, or is feeble or uneasy, knife should not be resorted to, but a caustic thread should be inserted with a needle after probing the sinus, and the thread should be moved often so that the sinus is cut. This method can be applied to *bhagaṁdara* as well (Su 4.17; AS 6.35; AHr 6.30; Vṛnda 47; Bhāv; Vang l. c.).

§ 78. **Ulcers :—** Usually there are two kinds of *vraṇa* "wound" : *śārīra* "bodily" or *nija* "own" i. e. caused internally and *āgantu* "accidental" i.e. caused by external causes (ulcer and wound). The former *vraṇas* i. e. ulcers are the following :— 1. By vāta. The ulcer is dark, hard, the discharge is thin, sparing, of varied colours, the pain is violent as by pricking, tearing, burning, beating,dragging etc. 2. By pitta. The ulcer is yellow or blue, the discharge is foul-smelling like cow-urine etc., hot and plentiful, the pain is as from cauterizing substances, burning wounds and the like, there is heat

and fever. 3. By kapha the ulcer is whitish, the discharge plentiful, white and tough, there is little pain. 4. By blood the ulcer is red like corals, the discharge consists of blood and pus, the smell is as from a horse's stable, otherwise everything is as by pitta. Eleven more forms that depend upon the different combinations of the above causes and symptoms are described by Su 4.1. The *vraṇas* on certain parts of body, like eyes, teeth, nose, abdomen, navel, ears, sides, armpits, chest are scarcely curable or incurable, so also the *vraṇas* in lepers, consumptives, diabetics and other patients, the chronic *vraṇas* which emit foul-smelling pus and foul blood and are deep-going, and those in which the skull is hurt and the brain is visible, etc (Car 6.25; Su 1.22; 4.1; AS 6.29; AHr 6.25; MN 268-71; Bhāv 2.3; Vang 608 ff.).

The curing methods for *vraṇa* tally very much with those for *śotha* and *śopha* (cf. § 69). Su 4.1.8 mentions 60 curing methods for *vraṇa*, viz. diet, anointing, bath, keeping warm, softening, nourishing, emetic, purgative, perforating, cutting open, probing, poultice, smearing with oil and butter, sprinkling, fumigation, smearing, helping scab-formation, cauterizing, branding, enemeta, dressing, nasal remedy etc. According to Suśruta (1.18.3) thick ointments are first to be applied to the *vraṇa*. He distinguishes *pralepa* that are cold and thin, *pradeha*, i.e. poultices and *ālepa* that are specially recommended and are of medium consistency, like a wet buffalo-skin and consist of a mixture of fat or oil and medicinal substances. Then come bandages *(bandha)* of which there are 14 kinds named mostly according to their form :— *kośa*—sheath or egg, a bandage full of medicinal substances on the joints of the thumb and other fingers, *svastika*—having the form of a *svastika* (cross-formed), on the joints, eye-brows, ears etc., *maṇḍala*—circular, on round parts of body, *yamala*-duel, when there are two ulcers. Linen, cotton, wool, silk, inner bark of trees, iron-plates etc. serve as the material for bandage. There are tight, medium tight and loose bandages. On the application of the ointment comes first a compress (*kavalikā*), on this a smooth, soft bandage material should be tied fast in such a manner that the knot may not come on the ulcer. The pressing of the abscess is done with a flat hand, once or repeatedly according to the requirement. According to Su 1.19 the patient must lie on a spacious and convenient bed in a room that is clean and exposed neither to sunheat nor

to wind, with a weapon side by (to overcome evil spirits), surrounded by friends who make him forget his pains by talking. He should avoid heavy food, spirituous drinks, movements, cold wind etc., fan the ulcer allowing it to rest, should not injure or press it. Cf. Car; AS; AHr; Bhāv l. c.; Su 4.1; Vang 609 ff.

§ 79. **Traumas** :— The second variety of *vraṇa* which arises from external causes or comes suddenly *(āgantu, sadyovraṇa)* includes wounds of every kind, such as caused by men, cattle, birds, serpents, insects, by a fall, blows, fire, cauterizing substances, poison, acrid substances or wound with a weapon, or an edged object (Su 4.1.3). Thus there are:– 1. *chinna*–cut. 2. *bhinna*–perforation. 3. *viddha*–paracentesis. 4. *kṣata*–superficial cut or crevice, but dangerous to the body. 5. *picchita*–contusion, arising from a stroke or pressure. 6. *ghṛṣṭa*–laceration of skin. In *bhinna* little blood comes out of the wound, but blood is discharged from the urethra, anus, mouth or the nose according to the internal organ that is wounded and there is fever, heat etc. In traumas there are 16 complications in general : St. Anthony's fire, hemiplegia, tetanus, lockjaw, delirium, madness, pain in the wounds, fever, thirst, cough, vomiting etc. (Car 6.25; Su 4.2. 1-23; AS 6.31; AHr 6.26; MN 272-6; Vang 616 ff.). For appeasing the blood and the heat the physician should apply cold remedies containing ghee and honey (Vṛnda 45.2). Blood-appeasing plants already known to the Vedic medicine (cf. Bloomfield, SBE 42,20 f.) are mentioned in large number, mostly with an addition of ghee or oil. Emetic and purgative, fast, diet and blood-letting are also recommended (AHr 6.26.9). In 1-4 there is great loss of blood and there is pain; the physician should give oil internally, externally and as enemeta and apply warm poultices around the wound. On the other hand, in 5 and 6 there comes only little blood, whereby heat and pus are produced, so cold ointments and moistenings should be used here. Cut-wounds on the head and on the sides should be sewn and bandaged firmly, similarly a cut off ear should be joined, sutured firmly and moistened with oil. If the trachea is wounded, so that the air rambles through, the parts should be united together, tied up, sutured firmly, sprinkled with goat's urine, the patient should lie on the back, should be bandaged and should eat in this position. Cut off arm or leg should be treated with hot oil, then it should be dressed with *kośa* dressing (cf. § 78) and the wound should be cured (Su 4.2.23 f. cf. Car; AS; AHr; Vang l. c.; Vṛnda 45; Bhāv 2.3).

§ 80. **Bone-fractures and Dislocations** :— Under the general term *bhagna*, *bhaṅga* "fracture" are gathered the fractures and dislocations arising out of a fall, stroke, pressure, attack by beasts of prey and other accidents. The dislocations *(saṁdhimukta)* are again divided into six kinds with the common symptoms : inability to stretch out the joints, to bend, to move or to turn, excessive painfulness and irritability by touch. Bone-fractures *(kāṇḍabhagna, asaṁdhibhagna*, are divided into twelve kinds. The general signs are : severe inflammation, manifold pain, immovableness, inability to tolerate a touch, uneasiness or pain by every position, noise in pressure, prostration. A splitted, dislocated or downward pressed hip-bone is incurable, so also crushed pelvis, a dismembered or crushed forehead-bone, a bone-fracture on the chest, on the back or head, a bone properly set up but again separated, abnormal bones or congenital deformity, a bone that is crushed, dismembered, fully broken or penetrated in the marrow is scarcely curable,so also the bone-fracture in an aged, the sick etc. (Su 2.15; AS 6.32; AHr 6.27; MN 277-81; Vang 626ff.)

A bone shifted below is to be pressed upwards, one gone upwards is to be pressed downwards. By pulling, pressing, raising, pressing together the skin and bandage, all joints in the body should be set right and made firm,and then they should be covered with proper stripes of cloth smeared with ghee and on these broad but thin and tough inner bark of a tree and pieces of bamboo and other trees should be tied. A loose bandage gives the joint no firmness, a too firm bandage causes severe pain, heat, suppuration and tumour. The bandage is to be renewed every three days in summer, every seven days in winter, every five days in medium temparature; cold decoctions of *nyagrodha*, lukewarm oil and other medicines are also to be applied on the place, or they are to be anointed with these (AHr 6.27.11-20). In early age the joint becomes firm after a month, in middle age it takes two months and in oldage three. Special rules are given for dislocations and fractures on the sole of the foot, thigh-bone, hip-bone, ribs, elbow-joint, knee, ankle-bone, hand-joint, arm, neck and throat, jawbone, nose, ears, skull etc. In a bone-fracture five pegs (*kīlaka*) should be fixed at different parts of body, so that the patient may lie quite peacefully and cannot move himself. If a part is only swollen by falling or by a stroke, and there is no

wound, cold poultices and washings are to be administered. The physician should ardently strive to avoid suppuration, lest healing may thereby be rendered difficult (Su 4.3; AS; AHr; Vang; Bhāv l. c.; Vṛnda 46).

§ 81. **Foreign Bodies** :—Foreign bodies of every kind are denoted as *śalya*, "edge of an arrow, thorn, splinter"; the art that is employed for the extraction of these foreign bodies, i. e. the surgery, is also called *śalya*. The *śalyas* are, like the *vraṇas*, either *śārīra* or *āgantuka*, i. e. caused from inside or from outside. The former include particularly hair, nails, urine, faeces, earwax, sand in the eyes and the like, and also the fœtus; the latter mean arrows *(śara)* and other iron objects. That a *śalya* pains in the body is generally known by the existence of a wound *(vraṇa)* with dark-coloured swelling, abscess formation, pain, constant discharge of blood which is raised like a bladder and contains soft flesh. Further symptoms change according as the *śalya* pierces the skin or the muscles, vessels, bones etc. Thus flatulence, constipation and coming out of urine, faeces and food from the wound are caused by a *śalya* in the bowels. A *śalya* in a bone causes manifold pain and a tumour. If the wound is externally closed and thereby the place of the *śalya* has become indiscernible, different measures must be applied for the purpose of diagnosis. Thus if the *śalya* pierces the arteries, vessels, canals or sinews, the patient should be made to ride in a carriage with broken wheels on a rough road. The place in which he feels irritation or pain is the seat of the *śalya*. Generally the seat of the *śalya* is there where there is irritation or pain by riding on an elephant or a horse, by ascending or climbing, coughing and sneezing and other violent movements or shocks. Many foreign bodies, especially bone and soft metal are dissolved in the body, while on the other hand horn, teeth, hair, iron, stone and the like are not absorbed (Su 1.26; AS 1.37; AHr 1.28).

The extraction of a *śalya* from the body by an expert surgeon by means of tongs *(yantra)* is compared in the law-books with the performance of a judge who extracts the sting of injustice in a law suit (Nārada 1.3.16). Su 1.27 mentions 15 procedures to extract a *śalya* :— Nature *(svabhāva)* i. e. the effect of dropping, coughing, sneezing and the like on the *śalya*, suppuration, cutting up, pressing, washing,

sucking etc. and the use of a magnet (*ayaskānta*) which, however, is to be applied only in big open wounds. A foreign matter approachable to the hand should be extracted with the hand, otherwise the knife or tongs should be used. If the patient faints, he should be made wet with cold water, dangerous parts should be avoided and one should speak friendly to him. The *śalya* can also be extracted by tying to a bridle of a horse which is hit till it moves the head; or the *śalya* is tied to a bent and strong branch of a tree and then the branch is let off. An insect in the ear is to be removed by filling the ear with salt-water. An unextracted *śalya* causes swelling, suppuration, violent pain and even death; therefore, it should carefully be extracted (Su 1.27; AS; AHr l. c.).

VII. Diseases of the Head

§ 82. **Eye-diseases**[1] :— The diseases of the part of the body above the collar-bone (*ūrdhvāṅga, ūrdhvajatru*) form a special group the treatment of which is gathered together under the name *śālākya* i. e. finer surgery, especially ophthalmology, from *śalākā*—probe, particularly for piercing the eye-skins. The Bower MS 2.848-90 and 1.68 ff. mentions cataract *(kāca, timira)* and many other eye-diseases. According to Su 6.1.29 f. there are 76 eye-diseases : 10 from vāta, 10 from pitta, 13 from kapha, 16 from blood, 25 from all doṣas, 2 external. The same number is given by Car 6.26.72 f. where reference is made to ophthalmological works (*śālākyatantra*) for details. According to Bhāv 2.4.87 there are 78 eye-diseases. cf. § 35. Causes of origination of eye-diseases *(netra–, akṣi–roga)* are : cold bath after hot exposure, looking at a distance, irregularity of sleep, dust or smoke, suppression of excretions or excessive vomiting, too much crying, grief or anger, wounds, sexual extravagance, defective diet etc. (Su 6.1.26-28; MN 366 ff.). The most important individual diseases according to Mādhava are :

1. Of the whole eye. Ophthalmia *(abhiṣyanda*, frequent even at present) of four kinds which, if neglected, lead to difficult ophthalmia (*adhimantha*) with pain as if the eye were torn out and half of the head were crushed, and by wrong treatment causes loss of eyesight within 5-7 days or even earlier. Suppuration of the eye (*netrapāka*). There is itch, secretion, dropping, pain and tumour. A particularly painful and incurable form of *adhimantha* demolishing the visual faculty is called *hatādhimantha*. If vāyu moves the eyebrows and eyes alternately with violent pain, it is called spasmodic convulsion (*vātaparyāya*). The dry irritation of the eye (*śuṣkākṣipāka*) or scrofulous ophthalmia (Dutt) is that in which the eye pinches and burns. *Anyatovāta* : the vāyu in the ears, head etc. causes pain in the eyebrows and the eyes. *Amlādhyuṣita*–iritis. *Sirotpāta*–the veins in the eyes become copper-coloured, with or without pain. If neglected, this develops into *sirāpraharṣa* whereby one continually drops copper-coloured drops and cannot see.

2. On the black part *(kṛṣṇa)* in the eye. *savraṇaśukla*–ulcer on the cornea with very hot discharge. *avraṇaśukla*–white spots without ulcer, i. e. non-transperancy of the cornea. *akṣipākātyaya*—

opacity of the whole cornea with suppuration. *ajakājāta*–" goat's excreta ", i. e. *prolapsus iridis* (Dutt, Hirschberg).

3. On the pupil or lense *(dṛṣṭi)*. By a disturbance of the first eye-skin or membrane *(paṭala)* one sees everything indistinctly. By disturbance of the second the eyesight is very corrupted; one sees flies, gnats, diaphrams, circles, flags, rays, rings and the like and thinks distant as near and near as distant. By disturbance of the third one sees big objects as covered with cloth, face without ears, nose and eyes and the like. A disturbance of the fourth membrane stops the vision completely and is called *timira* (darkness) or *liṅganāśa* (loss of sight, cataract). If this dangerous disease is not fully developed, one can see the Sun, moon and the stars and lightning in the sky. Among the different kinds of cataract and allied diseases, the following are prominent : disturbance by pitta, by which one sees everything yellow; disturbance by kapha, by which night-blindness *(naktāndhya)* which is frequent even at present, takes place; *hrasvajāḍya*—whereby one sees small objects by day only with trouble; *nakulāndhatā*— whereby one sees by day everything spotted; *gambhīrikā*—" deep ", i. e. atrophy of the eye.

4. On the white *(sukla)* in the eye. *Arman*— 'wing-skin' (Pterygium) of five kinds; among them *adhimāṁsārman*—a stretched, thick, liver-coloured new formation. *Śukti*—tumours, brown, flesh-coloured or conch-coloured dots. *Arjuna*—a singular dot with the colour of hare's blood. *Piṣṭaka*—a white outgrowth. *Jāla*—"Netlike" and *Sirāvṛta*—"full of vessels", phlyctenular inflammation ? *Balāsa*–a brass-coloured, soft, waterdroplike dot, membrane-cyste ?.

5. On the joining part *(saṁdhi)*. *Pūyālasa*—a ripe, painful and suppurating abscess on the *saṁdhi*. *Netranāḍī*—lachrymal fistula is fourfold according to the nature of the discharge. *Parvaṇikā* and *alaji* are copper-red, painful outgrowths on the ridge of the cornea. *Kṛmigranthi*—between the eyelids and eyelashes, phthriasis (Hirschberg).

6. On the eyelids. *Utsaṅgapiḍakā*—internally open and copper-red pustule on the lower eyelid. Cyste ? *Kumbhīkā*– barleycorn (Hirschberg). *Pothakī*—dropping, painful pustules. *Vartmaśarkarā* —eyelid gravel (Hirsch). *Arśovartman*— hard corns (Hirsch). *Śuṣkārśas*—"dry growths" (Hirsch). *Añjananāmikā*—a soft, little pain-

ful, small outgrowth. *Bahalavartman*—hard growths allover the eyelid. *Vartmabandhaka*—the swollen eyelids do not wholly cover the eye. *Kliṣṭavartman*—acute catarrh (Hirsch). *Vartmakardama*—Blenorrhoea (Hirsch). *Śyāvavartman*— eczema ? *Praklinnavartman*—external painless swelling, internally severe dropping. *Aklinnavartman*—the eyelids as if pasted. *Vātahatavartman*—lagophthalmus (Helfreich). *Arbuda*—an internal growth. *Nimeṣa*—twinkling lidcramp. *Śoṇitārśas*—growth in the middle, which grows again if cut out. *Lagaṇa*—a big, hard, painless growth. *Bisavartman*—external swelling and manifold perforation of the lids, inflammation of the spleen (Hirschberg). *Kuñcana*—fall of lids (Hirsch). *Pakṣmakopa*-introversion of the eyelashes, entropion ? *Pakṣmaśāta*—fall of hair on the eyelashes with burning of the lids (Hirsch). (MN 366-403; Cf. Car 6.26.102 f.; Su 6.1-7; AS 6.11-20; AHr 6.8-16; Vang 783 ff.; Bhāv 2.4). On *kukūṇaka* of children see § 50.

(1) Cf. Hirsch, *Geschichte der Ophthalmologie in Grafe und Samisches Handbuch* 7, 238-42 (Leipzig 1877). Hirschberg, *Geschichte der Augenheilkunde*, ibid. 2nd edition, 31-50 (Leipzig 1899). Magnus, *Geschichte des grauen Staares* (Leipzig 1876).

§ 83. **Treatment of eye-diseases** :— According to Bower MS 1.78 ff., 2.847 ff, especially facial plaster, washings or injections (*āścyotana*), ointments particularly of antimony, and suppository should especially be used. Car, Vṛnda and other authors say nothing of the operative treatments. On the contrary, all 76 eye-diseases except the 24 difficult or incurable ones are to be treated, according to Su 6.8, with excision, scarification and other operations.

Cataract operation[1] : " In middle (moderate) temperature the surgeon should himself sit in the morning in a bright place on a bench which is as high as his knee, opposite the patient who is sitting at a lower level, has bathed and eaten and sits fastened (on the ground) (held by a servant sitting behind him-AS). After warming the eye of the patient with the breeze of his mouth, and rubbing it with the thumb and after perceiving the impurity in the pupil (lense), he takes the lancet (*śalākā*) with the forefinger, middle finger and thumb fast in his hand while the patient looks at his own nose and his head is held firm. He inserts it in the natural opening (pupil) on the side, ½ finger far from the black and ¼ finger from the

external eye-corner and moves it upwards to and fro. He pierces the left eye with the right hand and / or the right eye with the left. If he has pierced rightly, then there comes a noise and a waterdrop flows out without pain. While encouraging the patient, he moistens the eye with woman's milk and then scratches the eye-apple with the edge of the lancet without causing pain. He then pushes the phlegm in the eye-apple gradually towards the nose where the patient must direct it by drawing up in the nose. Whether the diseased place (*doṣa*) is firm or moving, he foments the eye from outside. If the patient can now see the objects (shown to him), then the surgeon should pull out the lancet slowly, should place greased cotton on the wound and let the patient lie down with fastened eye."

Ophthalmia *(abhiṣyanda)* is to be treated with fasting, plaster, hot poultices, blood-letting, purgative, anointing and infusing by drops. In bird's skin *(arman)* the eye is first to be smeared with lemon juice and salt for the purpose of relaxing, then the flesh-plate in the hanging *arman* should be seized with a hook, it should be extracted out with the needle and thread and it should be cut off with a rounded knife. An outgrowth (?*parvaṇī*) is also to be siezed with a hook and to be cut off in the middle, otherwise to be treated like *arman*. Scarifications come into consideration especially in the case of diseases of eye-lids; the eye is to be moistened with a piece of cloth dipped in warm water and then to be scratched with a knife or leaves (Car 6.26. 221 f.; Su 6.8-19; AS 6.12-20; AHr 6.9-16; Vang; Bhāv l.c.; Vr61).

(1) The description given here is from AHr 6.14. It is simpler and clearer than the parallel passage Su 6.17-55 ff. translated by Stenzler in Haser l. c. 32 f., by Weber in Magnus l. c. 179 and by G. Oppert in Hirschberg l. c. 38 f. Also cf. AS 6.17.

§ 84. **Ear-diseases** :— There are twenty-eight ear-diseases *(karṇaroga)* according to Su, and twenty-five according to AS, AHr. MN records the following ear-diseases : *Karṇaśūla*–Otalgia. *Karṇanāda*–ringing in the ears; one hears manifold noises, as of beating kettle-drums or shells. *Bādhirya*— deafness, is caused when the vāyu blocks the auditory passage. *Karṇakṣveda*— noise in the ear. *Karṇasaṁsrāva*—Otorrhoea, is caused by a blow or diving in water or suppuration of an abscess. *Karṇagūthaka*—formation of earwax. *Karṇapratināha*—the earwax is fluid and comes out of the nose and mouth

with severe headache. *Kṛmikarṇaka*— maggots or mites originating in the ear; the winged insects or hundred-feeted accumulating in the auditory passage also cause violent pain. *Karṇavidradhi*— abscess in the ear, from wound or from the doṣas. *Karṇapāka*—suppuration in the ear. *Pūtikarṇaka*, stinking discharge from the ear. *Paripoṭaka*, inflammation of the lobe of the ear. *Utpāta, (Utpāṭa)* a suppurating tumour on the lobe of the ear caused by external causes. *Unmanthaka*— tumour. *Parilehin*— Eczema (MN 352-57, cf. Su 6.20; Car 6.26.210 f.; AS 6.21; AHr 6.17; Vang 760-2; Bhāv 2.4).

Filling the ear with oil and various medicinal stuffs appears to be the most usual procedure for these diseases; thus the Bower MS 2.532 ff. has six recipes for preparing the oil or ghee with long pepper and other substances in order to fill the ear therewith in *karṇaśūla, karṇanāda, karṇakṣveḍa* and *karṇaruj*ā. Later authors give similar recipes, e. g. the recipes denoted as kṣāratails which is good for otalgia, deafness, stinking discharge, ringing in the ears, suppuration and maggots (Vr 59.16-20=AHr 6.18.26-30). As the stuffs to be used, the following are also mentioned : ginger-juice, honey, salt, garlic, devdar, lemon-juice, urine of different animals, etc. Nasal remedy, fumigation, washing, local warmth, emetic and purgative, conveying steam through a reed (*nāḍīsveda*), gargling and other cures are also recommended. Exercise, diving with the head, sexual intercourse should be avoided. Earwax should be removed with a pointed instrument *(śalākā)*; insect or impurities in the same way, or by sucking with a horn. For ear-abscess the procedure should be the same as for other abscesses. For maggots in the ear, maggot-remedies are to be resorted to (Car 6.26.212 f.; Su 6.21; AS 6.22; AHr 6.18; Vang 762-71; Bhāv 2.4; Vr 59). For diseases of lobe of the ear, plasters are to be particularly applied (Su 1.16.26 f.).

§ 85. **Otoplasty, Rhinoplasty, Cheiloplasty** :— Manu 8.125 mentions the ears and nose among the parts of the body on which punishments are to be executed. Cutting of nose was the usual punishment for adultry. Such judicial demolitions may perhaps be looked upon as the chief cause for the introduction of Indian surgery in relation to the treatment of cut off ears and nose.If one is deprived of the lobe of the ear, an expert surgeon should cut from his cheek a piece of living skin in such a way that it remains connected with the cheek

and should manufacture a lobe of the ear therefrom after scarification of the place (Su 1.16.14 f.; AS 6.22). If one has lost his nose, the surgeon should cut a leaf of equal size from a tree, place it on the cheek and cut out from the same an equal-sized piece of skin and flesh, suture the cheek with needle and thread, scarify the existing piece of nose, put on quickly but carefully the cut up skin on it, join it properly with a large bandage and stitch the (new) nose firmly. Then he should put in carefully two reeds in order to ease the breathing and when it is elevated thereby, he should moisten it with oil and sprinkle it with red sandal and other blood-sucking powders. White cotton should then be placed on it and it should often be sprinkled with sesame oil. The operated person should then be given ghee and later a purgative. Suśruta also appears to have spoken of the intersection of the bridge. If after cure the nose has too much flesh or skin, it should be cut up and stitched once more. If it falls short, it should be enlarged. For cut up lips similar procedure as for nose-making should be adopted except putting in of the reeds (Su 1.16.27 f.; AS 6.22; AHr 6.18.59 ff.).

The Indian rhinoplasty has acquired certain fame by its early appearance and its effect on the plastic operation of European surgeons (Carpue, Grafe, Dieffenbach, perhaps also Branca and Tagliacozza)[1]. Although in the operations of Indian surgeons attested in the 18th century, the skin of the forehead was used for the nose reparation, the connection of the same with the old method using the skin of the cheek cannot be doubted[2]. Haas explained Suśruta's description of the rhinoplasty as a maceration of a similar passage from Celcus (7.9) and pointed to a remark in Cakradatta's commentary on Suśruta according to which the whole Suśruta passage would be spurious (*anārṣa*)[3]. However, the description in Celcus has only a distant similarity with that of Suśruta, and according to Ḍallaṇa "Jaiyyata, Gayadāsa and others" i. e. the oldest commentators recognised the passage as genuine[4]; its antiquity is also warranted by the parallel passages in AS, AHr containing many further details.

(1) Cf. Zeis, *Litteratur und Geschichte der plastischen Chirurgie* (Leipzig 1863) 61 f. (with Roth's translation of Susruta I. 16), Bardeleben, *Lehrbuch der Chirurgie und Operationslehre* I. 744 ff. (7th ed. Berlin 1874). (2) Zeis, l. c. 213 (3) ZDMG 30, 659. (4) cf. Roth, ZDMG 48, 140, Dallana 156.

§ 86. **Nasal Diseases** :— According to Suśruta there are 31 nose-diseases, according to Bhāv 34 nose-diseases (*nāsāroga*), according to AS, AHr only 18 *pīnasas*. In *pīnasa*, according to Mādhava, the nose is constipated, dry or full of phlegm, heated and one suffering from it has neither taste nor smell. In unripe or acute *pīnasa* there is heaviness in head, loss of appetite, thin discharge from the nose, indistinctness of voice, frequent spitting. In ripe *pīnasa* there are similar symptoms, but the phlegm remains toughly stuck to the nose, the voice and appearance of phlegm are normal. In *pūtinasya* (Ozena) the breathing from the mouth and nose is bad smelling. In *nāsikāpāka* excessively suppurating abscesses are formed. *Pūyarakta*—discharge of pus mixed with blood, is the result of derangement of doṣas or of wounds. Of sneezing (*kṣavathu*) there are two kinds. In *bhraṁśathu* there is tough salt phlegm, in *dīpta* there is hot breath from the nose, in *pratināha*, it is constipated, in *srāva* it is fluid, in *nāsāpariśoṣa* the respiration is much hampered by the dryness of phlegm in the nose. The five kinds of cold or catarrh (*pratiśyāya*) are exhaustively described. By long duration this disease which is related to *pīnasa* is incurable, maggots are caused in the nose, as is the case frequently in '*peenash*' even to the present day according to Chevers. There is also deafness, blindness, smelllessness, dangerous eye-disease, tumour, indigestion and cough. Of different kinds of abscesses, swellings and polypus of the nose which are denoted as *arbuda*, *śotha* and *arśas*, there are 7+4+4=15 kinds besides the 4 kinds of raktapitta i. e. epistaxis (MN 358-65; cf. Su 6.22-24; Car 6.26.102-115; AS 6.23; AHr 6.19; Bhāv 2.4.127 ff.; Vang 771 ff.).

For these diseases— especially for *pīnasa*, *pūtinasya*, *bhraṁśathu*, *nāsāsrāva*, *nāsāśoṣa* and *pratiśyāya* infusions (*avapīḍa*) and other nasal remedies are prescribed. Many recipes are related to *pīnasa*. Persons suffering from this are advised to stay in a house protected from wind, they should cover the head with a heavy piece of cloth, should avoid cold water, intercourse with women, very dry food, grief and anxiety, fresh spirituous drinks. In cold affection, fumigation should be applied (Car 6.26.116-139; Su 6.23; AS 6.24; AHr 6.20; Vr 60; Bhāv; Vang l. c.)

§ 87. **Mouth-diseases** :— The diseases of the mouth cavity (*mukharoga*) fall into the diseases of lips, gums, teeth, tongue, palate,

throat, and the whole mouth cavity; in all they are 65. By derangement of doṣas, blood, flesh or fat, the lips become rough, hard, stiff, painful, yellow, red, swollen etc., there appears an eruption, or there arise maggots, pus or watery discharge. Gums :–*śītāda*—scurvy, *dantapuppuṭa*—swelling at the teeth, *dantaveṣṭa*—inflammation of gums with bloody suppuration, *śaiśira*—painful tumour on the teeth roots, *mahāśaiśira*—burning inflammation of the gums with foul breath from the mouth, *vaidarbha*—tumour on the tooth-roots by wound to the same, *khalivardhana*-supernumerary tooth, *karāladanta*— projecting tooth, *adhimāṁsaka*— tumour on wisdom tooth, *dantamūlagatā nāḍī*—teeth fistula. Teeth :–*dālana*—toothache, *kṛmidantaka*—caries, *bhañjanaka*—breaking of teeth, *dantaharṣa*—sensitive tooth, *dantaśarkarā*—tooth-tartar, *kapālikā*—hard, pernicious tooth tartar, *śyāvadantaka*— brown burnt teeth. Tongue :- By vāta it becomes sprung up and benumbed. By pitta, hot and covered with reddish elevations. By kapha, heavy and thick and surfeited with thorny outgrowth. A severe swelling on the tongue with suppuration on the root of the tongue is called *alāsa*—Glossitis; a tumour like a second tongue *upajihva*—Ranula. Palate :- *galaśuṇḍī*- swollen tonsils; *tuṇḍikerī*—abscess of the tonsils; *adhruṣa (abhruṣa)*—a red and very painful tumour with fever; *kacchapa*—a painless tumour, hypertropy of tonsils; *tālvarbuda*—tumour in the middle of the palate; *māṁsasaṁghāta*—painless tumour; *puppuṭa*—painless tumour of the size of a berry; *tāluśoṣa*—inflammation of the palate; *tālupāka*—abscess on the palate. On the diseases of the throat see § 64. Mouth :- *sarvasara*—spread inside everywhere, pustules in the whole mouth, painful or painless, three kinds by vāta, pitta and kapha (MN 337-51 and Dutt, Nidāna 206 ff. cf. Car 6.26.170-174; Su 2.16; AS 6.25; AHr 6.21; Bhāv 2.4.135 f.; Vang 738 ff.).

For diseases of lips special ointments should be applied,so also gargling remedies and other mouth remedies, leeches, local warmth etc.; for affection of gums blood-letting as well as gargling remedies, application of powder to the gums, plaster, cutting off of corrupted flesh on the tooth-root and extracting the painful and supernumerary teeth irrespective of whether they are loose or firm, branding etc. For toothache gargling with lukewarm water, decoctions, warming, fumigation, nasal remedies are recommended; tooth-tartar is to be removed without injuring the tooth-root; loose teeth are to be

extracted. In diseases of teeth one should not take sour fruit, cold water, dry or very hard things, also should not chew nauseous sticks for cleansing the teeth. For diseases of the tongue cauterizing, water-gargling, scarification, fumigation, nasal remedies are to be applied. Swollen tonsils should be extracted out and one should cut out a piece of them. Similar tumours on the palate should be operated or scarified; for inflammation of and abscess on the palate, gargling with water is particularly prescribed. For the affections of the whole mouth salt-powder, water, gargling, nasal remedies and the like are indicated (Car 6.26.175-200; Su 4.22; AS 6.26; AHr 6.22; Vr 58; Bhāv; Vang l. c.).

§ 88. **Head-diseases** :—Diseases of the head *(śiroroga)* arise from smoke, heat, frost, excess of sleep or want of sleep or excess in use of water and spirituous drinks, suppression of tears or weeping, maggots, unfavourable smells and other causes (AS, AHr.). 1. By vāta suddenly violent headache arises which becomes particularly severe at night, but is reduced by bandage and warmth. 2. By pitta heat in the head is caused as if by glowing coals, relief comes at night and by the use of cold things. 3. By kapha the head is heavy, stiff and cold, eyelids and mouth are swollen. 4. By tridoṣas combination of these symptoms. 5. By blood the symptoms are as by pitta, besides there is sensitiveness to pressure. 6. By destruction of fat and other basic elements in head, severe headache arises which is reduced by warming, blood-letting and similar measures. 7. By maggots blood and pus come from the nose. 8. Caused by the Sun, *sūryāvarta*. In the eyes and eyebrows there is severe pain at sunshine which ceases at night. 9. *anantavāta*, violent pain in the neck, eyes, eyebrows and temples. 10. *ardhāvabhedaka*- migraine. 11. *śaṅkhaka*— severe pain in the temples (MN 404-11; Su 6.25; cf. Car 6.26.140; AS 6.27; AHr 6.23; Bhāv 2.9; Vang 836 ff.).

The treatment is partly internal with different ghee-decoctions and regulation of diet, partly external with nasal remedies, plastering, washing, dipping the head in cold water, poultices, blood-letting, fumigation, warmings etc. (Car 6.26.141-169; Su 6.26; AS 6.28; AHr 6.24; Vr 62; Bhāv; Vang l. c.).

VIII. Nervous & Mental diseases, Toxicology

§ 89. **Diseases of Vata** (*vātavyādhi*) :—These mostly nervous diseases are caused by filling of the empty canals of vāta either in the whole body or in particular parts, when it is deranged by unsuitable or insufficient diet, overexertion, loss of blood, anxiety, grief etc. Symptoms : contraction and stiffness of the joints, the bones as broken down, goose-skin, phantasy, pain in the arms, in back and in head, the limbs shrunk up, sleeplessness, abortion and loss of menses in women, of sperm in men, convulsion and numbness of limbs etc. The deranged vāta can further cause the most varied other diseases according to the part in which it comes, thus in the bowels it causes constipation, heart-disease, swelling of the body, hemorrhoids etc. The five kinds of vāta, if accompanied by pitta, also cause different troubles. Special vātarogas are :— *ākṣepaka*—convulsions; *apatantraka*— apoplectic convulsions; *dāruṇa apatānaka*— hysteric convulsions (?) *daṇḍāpatānaka*— the body is stiff like a stick; *dhanuḥstambha*—the body is crooked like a bow, tetanus; *abhyantarāyāma*—the body is bent inside like a bow; *bāhyāyāma*—curving outside, an incurable form; *pakṣavadha*—hemiplegia (vedic *pakṣahata*); *sarvāṅgaroga*—paralysis of the whole body: *tetanus universalis*; *ardita*—facial paralysis; *hanugraha*— lockjaw, trismus; *manyāstambha*—stiff neck, *jihvāstambha*—tongue-paralysis, *śirograha*—brain paralysis (?), *gṛdhrasī*— Ischias (sciatica); *viśvācī*—paralysis of the arms and hands; *kroṣṭukaśīrṣa*—inflammation of the knee joints; *kalāyakhañja*—St. Vitus' dance (?) *vātakaṇṭaka*—dislocation of the foot-joint; *pādadāha*— burning in the feet particularly while walking[1]; *pādaharṣa*—numbness of the feet; *avabāhuka*-convulsion or stiffness in the arm; *vepathu*—paralysis agitans etc. Limping and complete paralysis, dumbness and stammering and other sufferings are also enumerated among *vātavyādhis* (MN 171-87 and Dutt l. c. 95-102; cf. Car 6.28; Su 2.1; AS 3.15; AHr 3.15; Vang 344 ff.; Bhāv 2.2).

As treatment, anointing, perspiring and nourishing remedies, enemeta, purgative are mentioned in general (Vṛ 22.1). Even a dry wood can be made flexible by greasing and warming, then what of a living part (AHr 4.21.5 f.) ? Firm bandages are also expedient. In lockjaw the physician should forcibly open the mouth (Su 4.4; AS 4.23; AHr 4.21; Car; Vang; Bhāv l. c.; Vṛ 22).

(1) Probably a form of ergotism (raphania) is meant by this dangerous disease. Cf. Hausinger, *Burning of the feet*, January 1. 257-95 (1846).

§ 90. **Rheumatism** :—Many of the *vātavyādhis* have a rheumatic character. This is pronouncedly the case with thigh-paralysis (*ūrustambha*), also named *āḍhyavāta*. The deranged vāta enters the hips and thighs and fills them with kapha whereby they become stiff, cold, senseless, felt as not of oneself and very painful. Preliminary signs are : sleepiness, fever, goose-skin, nausea, vomiting, weakness in upper and nether thighs etc. Then excessive weariness in all parts and continual heat and pain in the thighs are felt, the foot aches while sitting down and is insensitive to cold, one cannot stand nor walk. The disease is fatal if there is heat, severe pain and shivering. The treatment, according to Caraka, falls into two kinds : internal and external. The latter consists of smearing, plastering, anointing and the like (Car 6.27; Su 4.5; AHr 3.15; MN 191 f.; Vang 426; Bhāv 2.2; Vr 24).

Along with *ūrustambha* is mentioned *āmavāta*—joint rheumatism, so named because it occurs chiefly by indigestion. The pain is first felt in the hips, then the whole body becomes stiff. Gout, loss of appetite, thirst, weakness, heaviness, fever, indigestion, numbness of limbs are the general symptoms. According to the dosa there arise further painful swellings in the joints of the hands, feet, joints, knees, thighs etc., with pain as by scorpion-sting, indigestion, nausea, heat, abundent urine-secretion, pain in the heart and other allied signs, or particularly heat and redness, or stiffness and itching. Fasting, perspiration, bitter and appetite-promoting and pungent medicines, purgative, nourishing substances and enemeta are recommended for cure (MN 192-4; Bhāv 2.2; Vang 4.29 ff.; Vṛ 25). Cf. also *vātarakta*, § 68.

§ 91. **Faint, Giddiness and Apoplexy** :–When the canals conducting consciousness are constipated by deranged dosas, man suddenly becomes senseless and falls to the ground as a piece of wood. General signs of the faint (*mūrcchā*) are : pain in the chest, yawning, weariness and mental weakness. Further signs vary according to the kind of the origination of the *mūrcchā*. Thus blue, black or red appears before the eyes of a man ill by vāta, he loses sense, but again

comes to senses quickly, shudders, has joint-pains and pain in the chest, is thin and the colour of his skin becomes brown-red. By seeing or smelling blood one becomes fainted and has stiff limbs, fixed sight and deep breathing. The drunk lies on the ground, speaks wrongly, is without senses or crazed and rolls about on the ground until the drink is digested. In poisoning there is shivering, sleepiness, thirst and loss of consciousness. If the body is felt as turning in a circle like a wheel and the patient falls continually on the ground, it is called "giddiness" *(bhramaroga)*. In apoplexy *(saṁnyāsa)* the doṣas become predominant and hamper all functions of the speech, body and mind, so that the patient becomes stiff like a piece of wood, resembles a corpse and dies on the spot if immediate remedies are not resorted to (Su 6.46; AS 3.6; AHr 3.6; Vang 312 ff.; Bhāv 2.2).

For faint cold sprinklings and baths, cooling precious stones like the *candrakānta* and necklaces, sandal and other cooling ointments, fanning with a fan, cold and fragrant drinks are generally to be applied. For giddiness pills and medicines are to be given. For apoplexy ointment and nasal remedy should be given, the patient should be fumigated, he should be pricked with needle in the flesh under the nails, his beard and hair should be pulled out, he should be bitten by teeth and the like. If he is not awakened by such stimulants, there is no remedy for him (Su; Vang; Bhāv l. c.; AS 4.9; AHr 4.7; Vr 17).

§ 92. **Intoxication and Delirium tremens** :–Spirituous drinks *(madya)* act like ambrosia by proper use, and like poison by improper use. Of the three or four stages of intoxication *(mada)* the first sharpens intelligence, memory and appetite, causes serenity etc., the second produces weakness of mind and memory, indistinctness of speech, sleepiness and the like, by the third stage a person does not remain responsible for his actions, so that he lets out secret, eats prohibited things, commits incests and the like, at the fourth stage he lies senseless on the ground like a piece of wood or a corpse. From drunkenness the diseased condition *madātyaya* arises with the following general symptoms : deafness, pain in the chest, diarrhoea, continuous thirst, fever, loss of appetite, trembling of the head, sides, bones and the heart, phantasy, bad dreams etc. As special signs by vāta Mādhava mentions : hiccup, breathlessness,

tottering of the head, pain in the sides, sleeplessness and much phantasy. According to Dutt, Delirium tremens is meant by this, yet the above general signs are common. Medicines, liquor with different additions, cold water drunk until the pacification of thirst, milk, ointments, smearings, baths, warm clothing, enemeta etc. are prescribed. According to Bhāv, the affections due to liquor can only be cured by liquor just as in burning wounds cauterizing and perspiring remedies are advantageous (Car 6.24; Su 6.47; AS 3.6; 4.9; AHr 3.6; 4.7; Vang 318 ff.; Bhāv 2.2; Vṛ 18.7).

§ 93. **Epilepsy** :—*Apasmāra* arises in the canals of the heart, particularly by grief, anger, greed, fear, joy and other mental excitations and is known by the throbbing of the eye-brows, twisting of the eyes, palpitation, deafness, discharge of saliva and phlegm from the mouth and nose, numbness, swooning, giddiness, sweat, flatulence, weakness and other signs. Four kinds are distinguished according to the dosas with symptoms : frequent change between senselessness and sudden return of consciousness, or prolonged attack by long intervals, frequent depression, foam from the mouth, delirium, groaning, trembling, biting the teeth, crookedness of the fingers, thirst, cold feeling, shuddering, to the patient everything appears black, white, or fiery etc. Old epilepsy is incurable, as well as *apasmāra* from tridosas, or if the patient frequently tugs with the limbs, becomes thin, the eye-brows are pulled upwards and the eyes roll. The attacks come after a pause of 10 or 12 days or a month or even oftener. For cure different medicines should be given, particularly decoctions in ghee or oil, enemeta, emetic and purgative, the bile of a dog as an ointment or smearing substance, nasal remedy, blood-letting, the patient should be brought to senses by pungent substances, he should be branded etc. The treatment should be like that for madness. When the attack is over, one should not rebuke the patient for what he had done during the same, but should attempt to cheer his soul (Car 2.8; 6.10; Su 6.61; AS 6.10; AHr 6.7; MN 169 f.; Vang 337 ff.; Bhāv 2.2; Vṛ 21).

§ 94. **Madness and Possession**:—Madness (*unmāda*) in its first stage is called *mada*, intoxication, excitation, and is caused by reasons similar to those for *apasmāra*. General symptoms are : delirium, uneasiness, rolling of eyes, despondency, irrelevant speech, a feeling

of emptiness in the heart. There are six kinds of *unmāda*. By vāta there is laughing without reason, crying, singing, dancing, jesticulating without reason, foam from the mouth, constant walking, talkativeness, adorning oneself with unsuitable things, desire to eat and nausea after eating, thinness, the skin is rough and red-brown, after digestion the signs are worse. By pitta there is especially violence, violent possession, desire to attack, predilection for nakedness and for shade and bath and the like. By kapha there is loss of intelligence and memory, loss of appetite, vomiting, salivation, taciturnity, predilection for loneliness, sleepiness, uncleanliness etc. By the three doṣas the condition is incurable. By painful excitation e. g., by the loss of property or beloved wife there is melancholia with unintentional weeping, lamenting and the like, or the patient sings, laughs, speaks pell-mell and the like. By poison the eyes become red, the face red-brown, there is feebleness and senselessness. *Unmāda* is fatal if the lunatic looks towards the ground, or in the height, becomes thin, void of strength and cannot sleep. Curable lunatics should be given medicines, especially decoctions with oil and ghee, purgative and emetic, enemata, ointment, nasal remedy, fumigation, or blood should be let out. Otherwise the patient should be thrown in a well without water and let to remain hungry there, or he should be tied with his face upwards in the Sun, or he should be branded with glowing iron, or he should be scalded with boiling oil or water, or should be chastised with lashes and then should be thrown in a grove, or should be left in a dark and empty place or should be frightened with serpents whose poison-tooth is extracted, or with tamed lions or elephants, or the death of a relative should be announced to him, or the servants of the king should take him in open air and threaten him with death. Along with these violent remedies, it is also recommended to cheer the lunatic with friendly talk (Car 6.9; Su 6.62; AS 6.9; AHr 6.6; MN 160-4; Bhāv 2.2; Vang 326 ff.; Vṛ 20)

The worse forms of madness are attributed to demoniac influence and are, therefore, denoted as possession (*bhūtonmāda*). There are 8 or 18 or 20 or " innumerable " demons and gods of insanity who attack the man if he acts against the religion, stays alone in a vacant house or in a burial place at night and the like. One can gather from his way of acting as to which spirit had attacked the patient. Thus one possessed by *Daitya* is malicious, wrathful, haughty, gives

himself out to be a god, likes spirituous drink and flesh. One possessed by a *Gandharva* sings and dances, adorns himself, bathes and anoints himself. One possessed by a serpent-demon has red eyes, fixed sight, crooked and staggering walking, stretches out the tongue, licks his mouth-angle, likes milk, honey and sweets. One possessed by a *yakṣa* seeks joy, is lavicious, prodigal, generous, talkative, staggers like a drunkard while walking. One possessed by a *piśāca* is uneasy, voracious, unclean, without memory, runs about, tears the flesh with nails, goes naked. For possession are prescribed various medicines to be taken internally, to be used as ointments, nasal remedy, fumigating remedy and the like. The treatment,however, especially conforms to the appeasement of the demons by different oblations, appeasing ceremonies, penances, religious donations, worship of Brahmans and the like rather than to the medicinal substances which are effective against demons.Every demon or god has his particular time when he attacks men.At this time the physician should offer him oblations consisting of milk, flesh, sugar, liquor and other food-articles, clothes, jewels and the like, on the place where the demon is accustomed to dwell (Car; Bhāv; Vang l. c.; Su 6.60; MN 164-68; AS 6.7 f.). On children-demons cf. § 50.

§ 95. **Poisons and Antidotes** :—The knowledge of poisons and antidotes *(kalpa)* forms one of the eight main subjects of medicine. According to Viṣṇu 3.88 the king should not take the food until it is ascertained by experiment whether it contains poison. According to Su 5.1 (cf. AS 1.8) these trials consist of various experiments on animals by giving them the food prepared for the king.If it is poisonous, crows, flies and other animals fall to the ground, the cuckoo becomes hoarse, the crane becomes mad, the parrot groans, the peacock rejoices, the monkey excretes, the eyes of a partridge change their natural colour by simply looking at the poison. Danger also threatens the king by the death-bringing embrace of a poisonous maiden *(viṣakanyā)* according to Su 5.1.6, a superstition which is particularly known from the drama Mudrārākṣasa and is also transferred to the European literature[1]. Therefore, it is the chief duty of the court-physician to protect the king from poisoning, and the inspection of the cooking house *(mahānasa)* is especially entrusted to him. A poisoner can be recognised by his speech and gestures. The special cultivation of toxicology can be explained partly on such grounds partly by the frequency of poisonous serpents and dangerous insects.

According to Mādhava there are two kinds of poison : *sthāvara* from stable things i. e. plants and animals, and *jaṅgama* from animals. The latter causes sleepiness, weakness, atony, heat, indigestion, goose-skin, tumour, diarrhoea; the former causes fever, hiccup, sensitiveness of teeth, throat-aching, foam from the mouth, nausea, difficult breathing and faint. From root-poison especially there is pain in the limbs, delirium and numbness; from leaf-poison there is yawning, shivering and difficult breathing; by fruit poison there is swelling of testicles, heat and loss of appetite; by flower poison there is vomiting, flatulence and difficult breathing; from bark juice or resin of poisonous trees there is bad smell from the mouth, roughness of the skin and headache; from chyle there is foam from the mouth, diarrhoea and heaviness in the limbs; from mineral poison there is pain in the chest, faint and heat in the palate. These poisons mostly cause death in course of time. If anybody is hit with a poisonous arrow, the wound suppurates immediately and successively becomes black, moist and very bad smelling, the flesh shrinks up, besides there is thirst, faint, fever and heat. The effects of serpent–bite are varied. Quickly fatal is the bite of the cobra or hooded serpent *(darvīkara)*. In the heat and cachetic conditions serpent–bites are particularly dangerous. Bad symptoms are : after the bite no blood comes out, no stripes are caused by strokes, bathing with cold water causes no goose-skin, a black and red tumour appears on the bitten place, there is lockjaw, blood flows from the mouth and the anus, there is loss of speech etc. *Dūṣīviṣa*, i. e. the poison that is old, dried out by fire, Sun or wind or decomposed by antidote or does not possess normal strength, acts mildly inasmuch as it never brings death, but has an after-effect for years together and brings about diarrhoea, bad smell and bad taste in the mouth and other troubles, difficult breathing, thirst, fever etc., in other cases madness or constipation or impotency or tongue-paralysis or leprosy and other diseases. Bites of 16 poisonous spiders are described in detail; they cause different kinds of boils with fever, heat, diarrhoea and other symptoms; so also the bites of rats and mice, scorpions, gad-flies, poisonous frogs, fish and leeches, house-lizards, hundred-feeted and other insects and the poison in the claws and teeth of the tiger, apes and other animals (MN 429-42). Su, AS and AHr deal with poison in more details. Yet, of the mineral poisons Suśruta mentions only *phenāsmabhasman*– a burnt stone, that is burnt orpiment and *Haritāla*'. AS besides men-

tions *rakta* (Cinnabar or copper ?). Among the numerous vegetable poisons mentioned in Su, AS and AHr, strychnine, vomiting nut *(kupīlu)*, opium *(ahiphena)* and Datura *(dhūstūra, unmatta)*[3] which are very much in vogue in India[4] are not met with. On the other hand, Su, AS and AHr also describe the madness of jackals, dogs, hyenas, bears, panthers, tigers and wolves and the disease *jalatrāsa*— hydrophobia arising from their bite (Su 5; AS 6.40-8; AHr 6.35-38; cf. Car 6.23; Bhāv 2.4; Vang 922 ff.).

The Vedic medicine is rich in spells against poisoning, arrow-poison and the bites of serpents, scorpions and insects and the Bower MS 6 contains a long incantation which the Buddha is said to have recommended for the cure of a *bhikṣu* bitten by a black serpent (king cobra) and which bears analogy with Car, AS, AHr where, however, it only serves as an accompanying recital while giving the antidote *(agada)*[5]. The medical works give in a large number recipes for such *agada*. They differ in vegetable and mineral poisons according to the stages in the effect of poison (*vega*), of which seven are distinguished :— 1. The tongue becomes black and stiff, simultaneously there is faint, shivering, oppression of breathing, exhaustion and vomiting. The poisoned person should be given an emetic, he should be sprinkled with cold water and an *agada* mixed with ghee and honey should be at once given to him to drink. 2. Shivering, perspiration, heat, pain in the throat, and pain in the chest if the poison had entered the stomach. As before, an emetic should be given first, then a purgative and an antidote. 3. Inflammation of the palate, violent pain in the stomach, the eyes become weak, pale and swollen, and there is pain, hiccup, cough and rolling in the body,if the poison has reached the bowels. An antidote should be given internally, as a nasal remedy and ointment. 4. The head is very heavy. An antidote with oil should be given. 5. Salivation from the mouth, decolourisation, pain in joints and body, derangement of all dosas. An antidote in a decoction of liquorice and honey. 6. Senselessness and severe diarrhoea. Treatment as for diarrhoea. 7. Paralysis of shoulders, back and hips, and death. Nasal remedy (Su 5.2.40-49; AHr 6.35). In serpent-bites also seven *vegas* are distinguished. A bandage of cloth, leather or inner bark of a tree is to be fastened above the bitten place, so that the poison may not penetrate in the body; or the place should be cut and branded if it cannot be fastened. Sucking,

cutting and branding of the place is in any case expedient. While fastening the bandage spells are to be recited; the above-mentioned spell in the Bower MS 6 refers to the dressing of the wound. Antidotes, blood-letting, emetic, nasal remedy, anointing, purgative, cold bath, leeches, scarification with a horn and other remedies are also recommended. Insect-prickings are particularly to be treated with warming, plaster and bath in lukewarm water. In difficult cases, the procedure in serpent-bite is to be followed. A wound caused by mad animals is to be treated with blood-letting and hot ghee, then it should be smeared with antidotes and the poisoned person should be made to drink old ghee. Among other remedies, the prescriptions to be used in madness are prominent (Car; Su; AS; AHr; Bhāv; Vang l.c.; Vr 68).

(1) Cf. Hertz, *Die Sage vom Giftmädchen*, Abhand. d. philos-philol. Cl. d. k. bayer. Akademie des Wissenschaften, XX, 89-166 (München, 1893). (2) Dutt, Mat. Med. 39. 41. (3) Dutt, l. c. 198. 111. 207. (4) Chevers, *A manual of judicial jurisprudence in India* (Calcutta 1870), 108 ff. (5) Cf. Hoernle, Bower MS, p. 226 ff. note; AS. 6.40.

Addenda

To Chaper 1 :— *The Report on the search of Sanskrit Manuscripts* (1895 to 1900) by Haraprasad Shastri (Calcutta 1901, pp. 25) shows important manuscript discoveries made by Haraprasad Shastri and Prof. Bendall in 1897 and 1898 in Nepal in the domain of ancient medical Sanskrit literature. A MS of *laṅkāvatāra*— "a Hindu Tantrika work on Medicine, in the Durbar Library" (in Katmandu) dates from Nepal Samwat 28=908 A. D.; a MS of the medical glossary *sūrottaranirghaṇṭa* by Ācāryavarya was written in 1080 A. D. A fragment of *kāśyapasaṁhitā* chiefly relating to the fever and its treatment is written about the same time. Kāśyapa is already mentioned in the Bower MS (2.1010-40) and in Caraka (1.1.9). The *Yogaśataka* with the commentary of Dhanvapāla in a MS of 1415 A.D., and the extensive *Yogasāra* are attributed to the famous Nāgārjuna. *Cikitsāmṛta* of Milhaṇa, an extensive text book of medicine, was composed in 1224 A. D. in Delhi during the reign of Sumsuddin Iltishmish, *Nāḍīparīkṣā* on pulse-feeling (cf. § 3) by Rāmacandra Somayājin was written in 1348 A. D. (Samvat 1405). *Yogamañjarī* of Vardhamāna, *Aśvavaidyaka* of Dīpaṅkara and *Aśvāyurveda* of Gaṇa deal with animal medicine. According to Cordier who has examined a part of these MSS, the commentary on Yogaśataka is by Dhruvapāla and not by Dhanvapāla (as communicated by him by letter). Cordier ("Origines" 82, 84) also mentions the fragments of Jatūkarṇa, Parāśara and Hārita found in Nepal, as well as remnants of the authors Vaitaraṇa, Pauṣkalāvata, Gopuraraksita mentioned by Suśruta. May these finds and particularly the extrabands of *Notice of Sanskrit Manuscripts on the MSS of the Durbar Library* announced by Haraprasad Shastri soon be published. For the Greek bearings on the Indian astronomy and so also on the Indian medicine (§ 16) compare the new information of the *Yavanajātaka* of Yavaneśvara which seems to be directly translated from the Greek and received between 169 and 269 A. D. (Report p. 8).

§ 5 :— *Nidāna* 1–32 was composed by Vijayaraksita, the remaining by Śrīkaṇṭhadatta. Cf. Cordier JA, 1901. I cannot agree with Cordier in fixing the date (about 1260–80) in view of the citation from Hemādri (§ 5).

§ 66 :— Cf. also Cordier, *La variole Śītalā* (January 1901).

Supplementary Notes

By the translator

p. 2. § 2 — Hundreds of works have been written in Sanskrit in modern times either on the entire medicine or on a part thereof. Only a few of these have been printed; others are lying in manuscript form in the various Manuscript-libraries in India. An exhaustive list of all such works is essential for a complete view of the Āyurvedic literature. A few important works other than those already recorded by Jolly may be mentioned here—(1) *Ajīrṇamañjarī* or *Amṛtamañjarī* by Kāśīnātha or Kāśīrāja or Kāśīrāma. Age of MS Saṁvat 1811. Printed. (2) *Añjananidāna*. Age of MS 1794 A. D. Printed at Nirnaya Sagar Press, Bombay; another edition by Harinarayan Śarma of Banaras, published by Kheladilal & Sons. (3) *Arkaprakāśa*, on the preparation of medicinal tinctures and essences. Authorship ascribed to Rāvaṇa. Written probably in the 16th century. Printed by (i) Ganesh Chandra Ghosh, Calcutta, (ii) Devisahay Shukla, with Hindi trans. Navalkishore Book Depot, Lucknow, 1935, (iii) Venkateshvar Press, Bombay, (iv) With Telugu comm. by D. Gopala Charlu, Madras 1914. cf. P. C. Ray, *HHC* II, lxxxi (4) *Vicārasudhākara* or *Arśoghnasudhākara* by Ranganātha Jyotirvid. Date 1765 A. D. The author was a resident of Junnar, Dist. Poona. cf. P. K. Gode, PO II, pp. 31-34, III pt. 2, 102-6, JGRS 1943, 145-9. (5) *Aśvalakṣaṇaśāstra* in 8 Adhyāyas. (6) *Aśvavaidyaka* by Dīpaṁkara, son of Nānākara. (7) *Aśvāyurveda* or *Siddhasaṁgraha* by Gaṇa, son of Durlabha. Contains 8 sthānas. (8) *Arkaprakāśa* or *Āyurvedaprakāśa* by Mādhava Upādhyāya, printed by Yadavji Trikamji Acharya, Bombay 1913. (9) *Āyurvedamahodadhi* or *Suṣeṇavaidyaka*—a nighaṇṭu. Published at Venkateshvar Press, Bombay 1915 with Hindi trans. by Ravidatta Vaidya. (10) *Āyurvedasūtra* by Yogānandanātha, written in the 16th cen. A. D., later than Bhāvaprakāśa. Published in Mysore University Series 1922. Another edition published at Venkateshvar Press, Bombay. (11) *Upacārasāra* by Mukunda Daivajña. It has a comm. named Gūḍhaprakāśikā by Dinakara Jyotiṣa written in śaka 1740. (12) *Kaṅkāligrantha*. Date 1500-10. Written by some courtier at the court of Nasir Shah Khalji of Malwa. The language is a mixture of Sanskrit and Hindi. cf. P. K. Gode, ABORI XII, pp. 289-91. (13) *Kalpadrumasārasaṁgraha*

by Jayarāma. Age of MS Saṁvat 1746. (14) *Kalyāṇakāraka* by Ugrāditya, printed at Sholapur 1940. (15) *Kāmaratna* by Śrīnātha, printed at Venkateshvar Press, Bombay. (16) *Kālajñāna* by Śambhunātha, printed at (i) Banaras, 1882, with Hindi trans. (ii) Venkateshvar Press, Bombay, with Hindi trans. (iii) M. R. Jagushte, with Gujarati trans. Age of MS Saṁvat 1711. (17) *Kāśyapasaṁhitā* or *Kāśyapīyagaruḍapañcākṣarīkalpa*—a work on toxicology. Published by Yatiraja Swami of Melkote, Madras 1933. (18) *Kūṭamudgara* by Mādhava with his own comm. Edns : (i) Venkateshvar Press, Bombay, with Hindi trans., (ii) edited by D. J. Rubern Jayatunga. Revised by Revd. M. Nanissar. With Simhalese trans., Colombo 1889, (iii) Krishnashastri Bhatavdekar, Bombay, 1664, with a new comm. (19) *Gandhakakalpa*—a tantra from Rudrayāmala. Edited by Yadavji Trikamji Acharya, Bombay, Vols. 2, 1911, 1915. (20) *Gaurīkāñcalikā*, printed at Venkateshvar Press, Bombay. (21) *Cikitsākramakalpavallī*, printed at Venkateshvar Press, Bombay. (22) *Cikitsāsāgara* by Vatseśvara. Age of MS Saṁvat 1785.(23) *Cikitsāsāra* by Gopāladāsa, printed. (24) *Jīvānandanam* by Ānandarāya Makhin, a minister of the Maratha kings at Tanjore. The drama is a metaphor on Āyurvedic science. Printed in Kāvyamālā series No. 27, 2nd edn. 1933, Nirnaya Sagar Press, Bombay. A revised edition with Sanskrit comm. by Duraiswami Iyangar is published by the Theosophical Society, Adyar, Madras. Von C. Cappeller has described this drama in an article (*Festschrift E. Windisch*, pp. 107-115, Leipzig, 1914). (25) *Dhāturatnamālā* by Devadatta, composed in śaka 1750. Published with Marathi trans. by Y. G. Dixit, Poona 1914. (26) *Dhārākalpa*, edited by Yadavji Trikamji Acharya, Bombay 1923 along with Rājamārtaṇḍa, Nāḍīparīkṣā and Vaidyamanoramā. (27) *Nidānapradīpa* by Nāganātha. Age of MS Saṁvat 1741. (28) *Paryāyārṇava* published with Dhanvantarinighaṇṭu in ĀSS, 1896. (29) *Pāradakalpa* —28th chapter of Rudrayāmala. Edited by Yadavji Trikamji Acharya, 2 vols. 1911, 1915, Bombay. (30) *Pratāpakalpadruma* by Ananta, written in 1792 A. D. (31) *Prayogacintāmaṇi* by Mādhava. On pharmacy. Published by Ramamaṇikya Sen, Calcutta. (32) Kumāratantra, printed at Venkateshvar Press, Bombay. (33) *Bālatantra* by Kalyāṇavarma, Printed at Venkateshvar Press, Bombay, with Hindi trans. (34) *Bhāvasvabhāva* by Mādhavadeva. Date of MS Saṁvat 1713. (35) *Madanakāmaratna*, composed later than 1000 A. D. (36) *Mallaprakāśa* by Kāyastha Lokanātha, composed about

1568 A. D. cf. P. K. Gode, ABORI XI, 96-9. (37) *Yogaśataka* attributed to Vararuci. comm. by Rūpanayana. Date of MS Samvat 1849. Published with a Simhalese comm. by Don. A. de S. Devarakkhita by M. P. Perera, 4th edn. Colombo, 1877. Another edn. is edited by Batuvantudave, Colombo, 1886. A third edn. is printed at Nirṇaya Sagar Press, Bombay, with Hindi notes. (38) *Yogasamuccaya* ascribed to Vyāsa Gaṇapati. cf. IA 1882, p. 106. Published by Jivaram Kalidas, Gondal. (39-40) Raghunātha Paṇḍita composed two works on medicine, viz. *Vaidyavilāsa* and *Cikitsāmañjarī* in 1699 A. D. He was a resident of Campāvatī (modern Chaul, in Kolaba dist. Bombay) cf. S. L. Katre, PO VIII, 1-2, P. K. Gode, PO VII, 3-4, Y. G. Phaphe, "Sahyādri" monthly, March 1938. Vaidyavilāsa was printed in Bombay 1830 A. D. cf. P. C. Ray *HHC* II, lviii. (41) *Lohapaddhati* by Sureśvara, edited by Yadavji Trikamji Acharya, Bombay. (42) *Lohasarvasva* by Sureśvara, edited by Y. T. Acharya, Bombay 1925. (43) *Vīramitrodaya* composed by Mitramiśra in 1602 A. D. is an extensive encyclopaedia which treats not only law but also medicine and other subjects. It is divided into eight sections called prakāśas; the first was published by Jiva. Vidya. (Calcutta, 1875) and the rest in Chowkhamba Sanskrit series. (44) *Vaidyakasāra* by Rāma, edited by Raghuvamśa Śarma with Hindi comm. Bombay, 1896. (45) *Vaidyakasārasamgraha* by Śrīkaṇṭhaśambhu. Age of MS Samvat 1791. (46) *Vaidyakaustubha* by Mevarama, printed in 1928. (47) *Vaidyacintāmaṇi* by Vallabhendra, edited by P. Venkatkrisnarao with Telugu trans. 6th edn. Madras 1921. (48) *Vaidyamanotsava* by Nayanasukha, Age of MS Samvat 1749. comm. by Rāmanātha. (49) *Vaidyamanoramā* by Kālidāsa. Edns : (i) Sukhadev Vaidya, with Hindi notes, Bombay, 1916. (ii) Y. T. Acharya, Bombay 1923. (50) *Vaidyavallabha* by Hastiruci, composed in Samvat 1726. Printed at Venkateshvar Press, Bombay. (51) *Vaidyavinoda* by Śankarabhaṭṭa. Written by order of Rāmasimha of Jaipur. Age of MS Samvat 1762. Edns : (i) Shridhar Shivlal, Bombay 1894. (ii) Venkateshvar Press, Bombay, 1913. (iii) Krishnashastri Navare, with Marathi trans. 2nd edition, Bombay, 1924 (52) *Vaidyāmṛta* by Moreśvara Bhaṭṭa. Date 1547 A. D. Editions :- (i) Krishnashastri Bhatavadekar with Marathi trans. 4th edn., Bombay 1862. (ii) with Hindi comm. by Jyotisvarup, Banaras 1867. (iii) with Hindi comm. by Ramanath Bhatta. (iv) In Simhalese characters, Colombo, 1870. (53) *Vaidyāvatamsa* by Lolimbarāja

edited with Gujarati trans. Ahmedabad 1908. (54) *Śārīrapadminī* by Bhāskara Bhaṭṭa composed in 1679 A. D. cf. P. K. Gode, BV VII pp. 33-34; Nathuram Premi Commemoration Volume. (55) *Śivakośa* by Karpurīya Śivadatta composed in 1677 A. D. cf. P. K. Gode, PO VII pt. i-ii, 66-70. (56) *Siddhasārasaṁhitā* by Ravigupta. MS dated 1374 A. D. (57) *Strīvilāsa* by Deveśvaropādhyāya. 16th cen. A. D.

p. 2. *l*. 32—*Āyurvedaprakāśa* is published by (i) Y. T. Acharya, Bombay, 1924 and (ii) Y. G. Dixit, Poona, with Marathi trans.

p. 2. *l*. 33—Trimalla flourished between 1383 and 1499 A.D. according Prof. H. D. Velankar (Catal. BBRAS MSS Vol. I, 1925, p. 59). He was a Tailaṅga Brahman, son of Vallabha, grandson of Siṅgaṇabhaṭṭa, father of Śaṅkarabhaṭṭa the author of Rasapradīpa. He also wrote Pathyāpathyanighaṇṭu, Vaidyacandrodaya, Vṛttamāṇikyamālā and Alaṁkāramañjarī. See § 11. Yogataraṅgiṇī is printed at (i) Venkateshvar Press, Bombay, and (ii) ASS, Poona, 1913.

p. 3. *l*. 2—*Rājavallabhīyadravyaguṇa* is printed at Venkateshvar press, Bombay.

p. 3. *l*. 9—Another work belonging to this period is Vaidyavinoda by Śaṅkara, son of Anantabhaṭṭa, who belonged to Śrīgauḍa family of northern Brahmans. His patron was Rāmsing, son of Jaising of Jaipur. So the date of the work is between 1668 and 1699. cf. S. L. Katre, PO IX pt. i-ii, pp. 68-9.

p. 3. *l*. 15—Maṇirām Miśra also wrote Guṇaratnamālā in 1642 A. D.

p. 3. *l*. 17—The work must have been composed between 1650 and 1725 A. D. cf. P. K. Gode, BV IV, pt. ii. pp. 154-6. Other editions of Yogaratnākara:—(i) Nirṇaya Sagar Press, Bombay, (ii) published by Y. G. Dixit, Poona, 1917, with Marathi trans. by D. B. Borkar. (iii) K. R. Navare, Bombay, 1907.

p. 3. *l*. 22—Lolimbarāja flourished before 1600 A. D. He was a resident of Junnar in Poona Dist. (Bombay state) and had married the daughter of a Muhammadan Subhedar of that place. After his wife's death he became an ascetic and devotee of the goddess Durgā at Saptaśṛṅga in Nasik Dist. A title *kavipātaśāha* was given to him by the people. His father's name was Divākarabhaṭṭa. Lolimbarāja wrote the following works :— (i) *Vaidyajīvana*, (ii) *Vaidyāvataṁsa*, (iii) *Camatkāracintāmaṇi*, (iv) Ratnakalācarita, (v) Lolimbarāja ākhyāna. The first three deal with medicine and are written in

Sanskrit. The last two are Marathi poems. Editions of Vaidyajīvana :—(i) with Sanskrit comm. by Sukhānanda and also with Hindi trans. Venkateshvar press, Bombay, 1910, 1920. (ii) Bombay, 1874. (iii) with Hindi paraphrase, Banaras 1880. (iv) with Hindi trans. Cawnpore, 1911. Commentaries on Vaidyajīvana :— (1) by Rudrabhaṭṭa Vaidya, son of Konerbhaṭṭa, (2) Vijñānandakarī by Prayāgadatta or Prayāgabhaṭṭa, (3) Dīpikā by Goswāmī Harinātha (4) by Bhavānīsahāy, (5) by Jñānadeva or Dāmodara, (6) Jagaccandrikā by Bhagīratha. cf. P. K. Gode IC VII, No. 3-4.

p. 3. *l.* 28—There is a comm. on Bhāv. by Jayadeva, son of Jayakṛṣṇa, compiled by order of Maharaja Raṇavīrsiṃha of Kashmir. Bhāvamiśra also compiled Vaidyanighaṇṭu in which names and properties of about 150 drugs more than are found in Dhanvantarinighaṇṭu are given.

p. 4. § 3—For the history of alchemy in India and the literature dealing with that science see Winternitz, *HIL* III, 552–3, Dr. G. K. Garde, *Vāgbhaṭa*, intro. pp. 10-16, P. C. Ray, *HHC* II, p. xxxi. The indigenous origin of alchemy is advocated by Hemaraj Pandit, *Kāśyapa Saṃhitā*, intro. pp. 101-3, P. C. Ray, *HHC* II, intro. pp. lxxxiii-xciii, Gaṇanath Sen, *PS*, intro.' p. 37. For the alchemy in Kauṭilya's Arthaśāstra, see Jolly, *Arthaśāstra*, Vol. I, intro. pp. 34 ff., Keith *HSL*, 460-1, P. V. Kane, *Hist. Dharm.* I, 103. To this period also belonged Vaidya Soḍhala—a Gurjara Raykabal Brahman of Vatsa gotra and son of Vaidyanandana. He wrote Gadanigraha (edited by Y.T. Acharya, Bombay, 2 parts, 1911, 1915) and Soḍhalanighaṇṭu. cf. D. K. Shastri, *Āyurved no itihās*, pp. 183-85. *Kākacaṇḍīśvarakalpatantra* by Kākacaṇḍīśvara may be earlier than Rasaratnasamuccaya because Kākacaṇḍīśvara is one of the 27 Siddhas mentioned in it. Edited by Ramkrishna Sharma, Chowkhamba Sanskrit series, Banaras, 1929. *Lakṣmaṇotsava* by Lakṣmaṇa composed in 1450 A. D. *Rasakalpa* was composed in 13th cen. A. D. *Rasakāmadhenu* by Cūḍāmaṇi, edited by (1) Y. T. Acharya, Bombay, 1925, (2) Jivram Kalidas, Gondal, 1925. *Rasakautuka* by Mallāri, date śaka 1604. *Rasakaumudī* by Mādhava, date 1500–1600 A. D. *Rasakaumudī* by Jñānacandra, printed at Lahore. Rasacaṇḍāṃśu by Dattātreya, printed. *Rasataraṅgiṇī* by Sadānanda, printed. *Rasapaddhati* by Śrībindu Vaidya with comm. by Mahādeva Paṇḍita. Edited by Y. T. Acharya with the comm. of Sureśvara, Bombay, 1925. *Rasaprakāśasudhākara* by Yaśodhara, written at Junagadh in 13th cen. Editions :— (1) Y. T.

Acharya, Bombay, 1923. (2) Jivram Kalidas, Gondal, 1926. *Rasamañjari* by Sālināth. Editions :— (1) Venkateshvar press, Bombay, (2) T. G. Kale with Marathi trans., Poona 1915. *Rasarājasundara* by Dattarāma, printed. *Rasasaṅketakalikā* by Cāmuṇḍa kāyastha. Edited by Y. T. Acharya, Bombay, 1912, 1923. *Rasasāra* by Govindācārya, edited by Y. T. Acharya, Bombay 1912. *Rasahṛdaya* by Govindabhikṣu, Editions :- (1) Y. T. Acharya, Bombay 1911 (2) T. G. Kale *Rasādhyāya*, printed in Kashi Sanskrit series, 1930. *Rasendracūḍāmaṇi* by Somadeva. 13th cen. *Rasendrasārasaṁgraha* by Gopālakṛṣṇa. 14th cen. Editions :— (1) Chowkhamba Sanskrit series, Banaras, 1937. (2) Venkateshvar press. Bombay. *Rasarājamṛgāṅka* by Bhojarāja, edited by Y. T. Acharya 1923.

p. 4. *note* 7—Other editions are : (1) Rasiklal Gupta (2) by Kalishchandra Vidyaratna (3) by Shaligram Vaidya with Hindi trans. Venkateshvar press, Bombay, 1919. (4) Lucknow, with Hindi trans.

p. 4.*l*.3—*Ṭoḍarānanda* is recently published by the Anup Sanskrit Library, Bikaner.

p. 4.*l*.13—also printed by D. G. Saṭekar, Khanapur (Dist. Belgaum) 1907.

p. 4.*l*.35—*Rasapradīpa* by Prāṇanātha Vaidya is printed at Venkateshvar press, Bombay.

p. 4.*l*.36—*Rasacintāmaṇi* is printed at Venkateshvar press, Bombay. Also printed by Jivram Kalidas, Bombay 1911 with Hindi trans. *Rasaratnapradīpa* by Rāmarāja is edited by Bhanudatta Vidyālaṁkāra, Lahore. *Rasārṇava* was composed in 12th cen. according to P. C. Ray. Printed in Bibliotheca Indica, 1910. *Rasendracintāmaṇi* by Ramacandra Guha. Date 14th cen. Editions :— (1) Umeshchandra Sengupta, Calcutta (2) Venkateshvar Press, Bombay.

p. 5.*l*.11—Other editions :— (1) Venkateshvar press, Bombay, (2) Y. T. Acharya, Bombay, 1913, Rasāyanakhaṇḍa.

p. 5.*l*.12—On the probable date of Nāgārjuna see P. C. Ray *HHC* I, liii ff., II, xxxix ff., *Mahārāshtriya Jñānakosh* V. 456.

p. 5.*l*.18—*Rasaratnasamuccaya* is also published with Bengali trans. by Devendranath Sengupta and Upendranath Sengupta, Calcutta 1915. Detailed information cf. Winternitz, *HIL* III, 553, P. C. Ray *HHC* I, xlii ff., II 222 ff. For arguments in favour of as well as against the authorship of Rasaratnasamuccaya ascribed to Vāgbhaṭa cf. Dr. G. K. Garde, *Vāgbhaṭa*, intro. pp. 23-4; D. C. Bhattacharya,

Date and Works of Vāgbhaṭa the Physician, ABORI XXVIII, pt. i-ii, 1948, pp. 112-27.

p. 5.*l*.27— Śārṅgadhara also wrote *Śārṅgadharapaddhati* (edition by Brahmashankar Miśra with Hindi comm. and notes, Banaras, 1942), *Śārṅgadharasaṁgraha*—a work on rasaśāstra, *Triśatī* or *Jvaratriśatī* (edition, Venkateshvar press, Bombay, 1912, with Sanskrit comm. by Vaidyavallabha and Hindi trans. by Kishorivallabh). Śārṅgadhara was a Gujarati Nagar Brahman. There are two more comms. on Jvaratriśatī : (1) Siddhāntacikitsā or Siddhāntasañcaya by Nārāyaṇa son of Kṛṣṇa and (2) by Meghabhaṭṭa.

p. 6.*l*.11—Other editions are :- (1) Kaviraj Pyarimohan Sengupta, Calcutta, 1296 B. S. (2) Lucknow, with Hindi trans. (3) Nirṇaya Sagar Press, Bombay, with comms. of Āḍhamalla and Kāśīrāma Vaidya. (4) with Marathi trans. by Chintamani Ballal Jyotirvid. (5) Parashuram shastri Vidyasagar, Bombay, 1920, with two comms. Dīpikā and Gūḍhārthadīpikā. There are two or three more comms. which are still unpublished.

p. 6.*l*.19—For the works of Vopadeva, see P. K. Gode, PO IV 49-62. There are at last three more comms. on *Śataślokī*—one of his chief works, besides the one written by himself. Śataślokī with Śataślokīcandrakalā is published by Laksmishankar N. Bhat, Bhavnagar, 1912 and by Krishnashastri Bhatavdekar, Bombay, 1860 with Marathi trans.

p. 6.*l*.23—Keśava has written a medical work called *Siddhamantra* on which his son Vopadeva has written a comm. called *Siddhamantraprakāśa* (edn by Y. T. Acharya, Bombay, 1909). Keśava lived in Vedapura.

p. 6.*l*.27— A work of this kind is *Jvarasamuccaya*, probably 1000 years old. cf. Hemaraj Pandit, Kāśyapa Saṁhitā, intro.pp.25ff.

p. 7. § 4—Other medical authors probably contamporary to Cakradatta were : Bhavyadatta, Govardhana, Vakulakara, Umāpati, Trilocanadāsa. They come from Bengal and are repeatedly quoted by Niścalakara. cf. D. C. Bhattacharya, *New Light on Vaidyaka Literature*, IHQ, June 1947. Other editions of Vaṅgasena's *Cikitsāsārasaṁgraha* are : (1) Jiva. Vidya. 2nd edn, 1893 (2) Venkateshvar press, Bombay, with Hindi trans. (3) Nandakumar Goswami,Calcutta, 1889. According to Prof. Nalininath Dasgupta (IC III pt. i, p. 150) Vangasena flourished in the 13th cen. But P. K. Gode has proved

him to have flourished before 1200 A. D., vide his article in IC III, pt. iii. pp. 535–43.

p. 7.*l.*17—Edited with Candraṭa's comm. by Kaviraj Narendranath Mitra with Hindi notes by Jayadeva Vidyālaṁkāra, Publisher, Mitra Ayurvedic Pharmacy, Lahore 1926. An edition of bare text is published by N. S. Mooss, Kottayam, 1950. The work was first published by J. Jolly, ZDMG 1906, pp. 413–66, with extracts from Candraṭa's comm. as well as German trans. Tīsaṭa lived about 950 A.D. according to Prof. D. C. Bhattacharya, ABORI, XXVIII.

p. 7.*l.*21—Candraṭa wrote *Yogaratnasamuccaya*, *Vaidyatriṁśaṭṭīkā* and *Pāṭhaśuddhi* of Suśruta.

p. 7.*l.*25—Other editions : (1) Venkateshvar press, Bombay (2) Hazarilal Shukla, Vols. 2 with Sanskrit and Hindi comms, 1930.

p. 7.*l.*36—*Cikitsāsārasaṁgraha* is also printed at Calcutta 1916, Lahore 1928 (Meherchand Lacchmandas), Nirnaya Sagar press, Bombay, 1911, Venkateshvar press, Bombay.

p. 8.*l.*33—Śivadāsasena besides wrote *Carakatattvapradīpikā* a comm. on Caraka and a comm. on *Dravyaguṇasaṁgraha* of Cakrapāṇi. The latter is printed by Devendranath Sen. Śivadāsasena was a Bengali Brahman and a resident of Malañchi in Pabna Dist. of Bengal. He was the court-physician of Barbek Shah of Bengal (1459–1476 A. D.).

p. 8.*l.*34—On Niścalakara- another commentator of Cakrapāṇi see P. K. Gode, PO IV, 49–62; Prof. D. C. Bhattacharya, IHQ, June 1947.

p. 9.*l.*7—Cakradatta's comms. on Caraka and Suśruta are printed at Nirṇaya Sagar press, Bombay, Caraka, 3rd edn. 1941, Suśruta (Sūtrasthāna only) 1941.

p. 9. § 5—To this period also belong the following works :—(1) Āyurvedasāra, 600–900 A. D. cf. D. C. Bhattacharya, IHQ, June 1947. (2) Bindusāra, 600–900 A. D. (3) Siddhasāra, 600–900 A. D. (4) Haramekhalā- a work in Prākṛta by Māhuka, date 965 A. D. Edn, Trivandrum, pts. 2.

p. 9.*l.*22—Vṛndamādhava with Vyākhyākusumāvali of Śrīkaṇṭhadatta (and completed by Nārāyaṇa) is edited by Hanumantashastri Padhye, Poona 1894.

p. 9.*l.*23—Besides there is another edition printed at Venkateshvar press, Bombay. Vṛnda belonged to the Kuñja family of East Bengal.

p. 10.*l*.15—Besides Rugviniścaya, Mādhavakara is also said to have written *Āyurvedaprakāśa*, *Āyurvedarasaśāstra*, *Kūṭamudgara* with comm., *Paryāyaratnamālā*, *Rasakaumudī*, *Yogavyākhyā*, *Suśrutavārttika*. Mādhavakara belonged to Bengal and his native place was Śilāhrada as mentioned in Paryāyaratnamālā.

p. 10.*l*.31—On the comparative chronology of Mādhava, Dṛḍhabala and Vāgbhaṭa—the author of AHr, see Hoernle, *Osteology*, p. 11., S. N. Dasgupta, *HIP* II, 433–4.

p. 10.*l*.33—Besides Madhukośa, there are the following comms. :— (1) Ātaṅkadarpaṇa by Vaidyavācaspati, son of Pramoda, 1240 A. D. (2) by Ramānāth Vaidya (3) by Bhavānīsahāya (4) by Nāganātha, son of Krishnabhaṭṭa (5) by Gaṇeśa bhiṣak (6) Siddhāntacandrikā by Narasiṁha Kaviraj (7) Siddhāntacintāmaṇi by Narasiṁha (8) Subodhinī by Māthura Kāyastha (9) Nidānapradīpa (10) Vaidyamanoramā by Rāmakrishṇa (11) Raiśarman (12) Mādhavanidānaṭippaṇī.

p. 11. *note* 6— The following editions may be mentioned :— (1) with comm. of Vijayarakṣita and Śrīkaṇṭhadatta and an additional comm. by Kavirāj Sharadacharan Sen, published by Kaviraj P.K. Sen, 2nd edn., Banaras, 1932. (2) with Madhukośa and ātaṅkadarpaṇa, Nirṇaya Sagar press, Bombay. (3) with Hindi trans. by Sohanlal Shastri. (4) with Hindi trans. by Pandit Maheshdatta, Lucknow. (5) with Hindi trans. by Dattaram, Bombay. (6) with madhukośa and ātaṅkadarpaṇa, Venkateshvar press, Bombay. (7) with Hindi comm. edited by Raghunāthprasad Sitāram, Bombay, 1884. (8) with comms. of Vijayaraksita and Śrīkaṇṭhadatta and Vācaspati Vaidya, edited by Y. T. Acharya, Bombay, 1920. (9) with ātaṅkadarpaṇa, edited by Chhotupati Sharma, Bombay, 1913. (10) Saggio di versione del Mādhavanidāna (translated in part by Mario Vallauri, Giornale della Sociata Asiatica Italiana, 26 (1913–14), 253–90.

p.12.*l*.1—The following additional comms. on AHr are recorded in the introduction to AHr, Nirṇaya Sagar press, 3rd edn. Bombay :— (1) Padārthacandrikā by Candranandana (2) Śaśilekhā or Indumatī by Indu (3) Aṣṭāṅgahṛdayodyota by Āśādhara (4) Manojñā or Cintāmaṇi by Ṭodar Mull Kanha Prabhu (5) AHr-ṭīkā by Rāmanāth (6) AHr-dīpikā by Hāṭakāṅka (7) Lalitā by Śaṅkara (8) Vākyapradīpikā by Parameśvara (9) Vijñeyārthaprakāśikā by Viśveśvara Paṇḍita (10) Hṛdayabodhikā by Dāsapaṇḍita (11) Vāgbhaṭārthakaumudī by Harikrishnasen Malik (12) Saṅketamañjarī by

Dāmodara (13) Pradīpa by Yashodanandan Sarkar (14) Vāgbhaṭakhaṇḍanamaṇḍana by Bhaṭṭa Narahari or Nṛsiṁhakavi, son of Bhaṭṭa Śivadeva (15) Āndhraṭīkā by Rāmānujāchārya (16) AHr-ṭīkā by Jejjaṭa (17) Bhaṭṭāra Haricandra (18) by Vācaspatimiśra (19) Manodayādityabhaṭṭīyā (20) Sāroddhāra by Bhaṭṭa Śrīvardhamāna (21) Bālaprabodhikā (22) Bālabodhinī (23) Karṇāṭī (24) Drāviḍī (25) Sugata (26) Kairalī (27) Pāṭhyā (28) Bṛhatpāṭhyā (29) Vyākhyāsāra (30) Hṛdya or Hṛdyārtha (31) AHr-vyākhyā (32) Śivadīpikā by Pandit Śivaśarmā (33) Tattvabodha by Śivadāsasena (34) Hṛdayabodhinī. There are besides (1) AHr-vaiḍūryakabhāṣya (2) Padārthacandrikāprabhāsa nāma AHr-vṛtti (3) Vaidyakāṣṭāṅgahṛdayavṛtterbheṣajanāmasūcī. These were translated into Tibetan. cf. S. N. Dasgupta, *HIP* II, 436.

*p.*12.*l.*3—On the life and works of Hemādri see P. V. Kane, *Hist. Dharm.* I. 354 ff.

*p.*12.*l.*26—For the date and works of Vāgbhaṭa see AHr intro., Nirṇaya Sagar press, 3rd edn. 1939; A. B. Keith, *HSL*, p. 510; Winternitz, *HIL* III, pp. 549–50; Hoernle, *Osteology*, pp. 10–11; S. N. Dasgupta, *HIP* II, 433; Dr. G. K. Garde, *Sārtha Vāgbhaṭa*, intro.; P. C. Ray, *HHC* I, xxii ff.; Prof. D. C. Bhattacharya, *Date and works of Vāgbhaṭa the physician*, ABORI XXVIII, pt. 1–2, 1948, pp. 112–27; P. K. Gode, *Chronological limits for the comm. of Indu on AS of Vāgbhaṭa I*, ABORI, XXV, pt. 4, pp. 217–30, 1945; H. D. Sharma, *Amarakośa*, intro. p. viii; R. V. Patvardhan, *Suśruta*, intro. p. 17.

*p.*12. *note* 2—Besides these the following editions of AHr are printed :— (1) Dr. G. K. Garde, with Marathi trans. Poona, 1891 (2) Calcutta, Jiva. Vidya. 1882, (3) Vijayaratna Sen Kaviranjan, Calcutta,1885-90, (4) Vijayaratna Sengupta, with Aruṇadatta's comm. and Bengali trans., Calcutta, 1888, (5) Krishnalal, with Hindi trans., Mathura,1910, (6) Motilal Banarasidass, Lahore,1933, (7) Behicharlal Nathuram, Ahmedabad, 1889, with Gujarati trans., (8) Kalishchandra Sengupta, with Bengali trans., Calcutta, 1890-95, (11) Venkateshvar press, Bombay, with the comms. of Candranandana, Aruṇadatta and Hemādri, 1928 (12) Harishastri Paradkar, Nirṇaya Sagar press, 3rd edn. Bombay, 1939, with comms. of Arunadatta and Hemadri, (13) S. C. K. Achutavarya, with Kairalī comm., Uttarasthāna, Kottayam, 1942, (14) N. S. Mooss, with Vākyapradīpikā comm. by Parameśvara, Sūtrasthāna, Kottayam, 1950, (15) A. M. Kunte, with

Arunadatta's comm.,Ganpat Krishnaji press, Bombay, 1880 (16) edited by Pandit Sarasvati with Tattvabodha comm. by Śivadāsa Sena. A German translation of AHr with an introduction, notes and indices is published by Luise Hilgenberg and W. Kirfel, Leiden, 1941.

*p.*13.*l.*9—Chemistry in Susruta cf. P. C. Ray, *HHC* I, intro. p.c.; II, 42.

*p.*13.*l.*12—T. Rudraparaśava of Trichur has published an edition of AS with Indu's comm. in three vols. 1924-6. Ramachandrashastri Kinjavadekar of Poona has published Nidānasthāna and Śārīrasthāna of AS.

*p.*13.*l.*14—Hārītasaṁhitā is in the form of a dialogue between the sage Ātreya and his son and pupil Hārīta. The printed text consists of 6 sthānas. The original Hārītasaṁhitā was known to Cakrapāṇi, Vijayarakṣita, Śrīkaṇṭhadatta, Śivadāsa and Tīsata. Passages from the same are quoted in their works as well as in Jvarasamuccaya and Ṭoḍarānanda. These quotations are not found in the printed text which shows that it is different from its genuine form. cf. Dietz, *Annals of Medicine*, p. 159, BBRAS Cata. No. 164; S. N. Dasgupta, *HIP* II, 432; Gananath Sen, *PS* intro. pp. 20-21; CC I, 765 B; Pandit Hemaraj, *Kāśyapa Saṁhitā*, intro. p. 25; G. N. Mukhopadhyaya, *SIH*, I, p. 5.

*p.*13.*l.*21—For the modern character of the so-called Saṁhitās see S. N. Dasgupta, *HIP*, II, p. 432. Some such works may be recorded here :— (1) *Viśvāmitra Saṁhitā* quoted by Cakrapāṇi in comm. on Car, Sūtra, chap. 27; comm. on Su, Sūtra, chap. 14; Śivadāsa in his comm. on Cikitsāsārasaṁgraha, Arśodhikāra (cf. Gananath Sen, *PS*, p. 23; S. N. Dasgupta, *HIP* II, 432, (2) *Kharanāda Saṁhitā*. Even though not available now, it was utilized by Cakrapāṇi, Vijayarakṣita (comm. on MN, Jvaranidānādhikāra), Hemādri (comm. on AHr, sūtra. 8.3), Aruṇadatta (cf. comm. on AHr, Cikitsita. 1.34,77). Keśava— a contemporary of Arunadatta, a protege of king Siṁhana or Singhana II (Siṁharāja) of the later Yādavas of Devagiri and a resident of Vedapura, refers to Khāranādi in his work called Siddhamantra. He is variously called as Kharanāda, Kharaṇādi, Khāraṇādi, Khāraṇāda. The name Kharaṇādi was current in Maharashtra, while in Bengal he was known as Kharanāda. Vopadeva in his Siddhamantraprakāśa comm. on Siddhamantra— the work of his father, also quotes from Kharanādi. Khāraṇādi's work seems to have been in verse. Kharanāda is also referred to in the

Ratnaprabhā comm. of Niścalakara on Cakrapāṇidatta's Dravyaguṇa-saṁgraha, and by Vācaspati in his comm. on MN (p.50). A leaf of the MS Khāraṇādanyāsa was discovered, among other things, in the excavations made by Pandit M. S. Kaul at Gilgit in Kashmir. This Khāraṇādanyāsa is a comm. on a work of Kharanāda on medicine, giving portion of a chapter relating to pregnancy. Both the text and the comm. are known at present through quotations only. The work of Kharanāda seems to have been older than AHr. Prof. P. K. Gode is inclined to fix A. D. 650 as the terminus before which Kharanāda may have composed his work, and about 850 A. D. as the terminus before which the Nyāsa was composed. cf. P. K. Gode, ABORI XX, pt. 1, pp. 97–102; PO IV, pp. 49-62. cf. also S. N. Dasgupta, *HIP* II, 432; Gananath Sen, *PS*, p.21. (3) *Parāśara Saṁhitā*, a work on Kāyacikitsā. This is quoted by Vijayarakṣita and Śrīkaṇṭhadatta and Śivadāsa (in his comm. on Cikitsāsārasaṁgraha of Cakrapāṇi, Rasacikitsā) cf. S. N. Dasgupta, *HIP* II 432; Gananath Sen, ibid. p. 20. (4) *Kṣārapāṇi Saṁhitā*, a work on Kāyacikitsā, quoted by Vijayarakṣita, Śrīkaṇṭhadatta and Śivadāsa (comm. on Cakrapāṇi's Cikitsā., Kāyacikitsā) cf. S. N. Dasgupta, ibid.; Gananath Sen, ibid. (5) *Jatūkarṇa Saṁhitā*, a work on Kāyacikitsā, mainly composed in prose. Quoted by Cakrapāṇi (comm. on Car, sūtra. 2.5), Vijayarakṣita (comm. on MN, Jvarādhikāra, Hikkāśvāsādhikāra), Śivadāsa (comm. on Cikitsā.). cf. Gananath Sen, ibid.; S. N. Dasgupta, ibid. (6) *Bhāradvāja Saṁhitā*, contains within it a small work called Bheṣajakalpa, a comm. by Veṅkateśa (Dr. Cordier, *Recent Discoveries of Medical* MSS in India, 1898-1900), cf. S. N. Dasgupta, ibid. (7) *Kāśyapa-saṁhitā*. A work on midwifery and gynaecology and children's diseases, edited by Y. T. Acharya and Pandit Hemaraj Śarma, Nirṇaya Sagar press, Bombay, 1938, with an extensive intro. by Pandit Hemaraj. A MS of this work was discovered in the Nepal Durbar library, Katmandu. It is a dialogue between Kāśyapa and Bhārgava. According to the editors, the work was taught by Ṛṣi Mārīca Kāśyapa, abridged by his disciple Vṛddha Jīvaka and revised by one of his descendents called Vātsya. This Kāśyapa seems to be the same as mentioned in the Bower MS. According to Pandit Hemaraj, Jīvaka, the compiler of this work is different from Jīvaka Komārabhacca, the physician of Gautama Buddha. The main portion of Kāśyapa Saṁhitā is divided into eight parts and contains 120 chapters. It has also a supplementary part comprising 80 chapters. There is much simila-

rity of construction between Caraka and Kāśyapa Saṁhitā. For detailed information regarding the date and composition cf. Hemaraj Pandit's Intro., also S. N. Dasgupta, *HIP* II, 432. (8) *Bheḍa Saṁhitā* published by the University of Calcutta (JDL IV, 1920). Incomplete. For the modern character of this work cf. Hoernle, JRAS 1909, pp. 869-70, 1910, pp. 830-34; Keith, *HSL*, p. 508; Kāśyapa Saṁhitā intro. p. 25; Gananath Sen *PS*, intro. pp. 189. There is a great similarity of composition between the Saṁhitās of Caraka and Bheḍa. The numbers of sthānas and chapters is the same in both the works. Even the names of certain chapters are identical. Attempts to prove the antiquity of Bheḍa Saṁhitā are made by Hemaraj Pandit, intro. to Kāśyapa Saṁ. pp. 104-9. Quotations from Suśruta Saṁhitā are found in the Bheḍa Saṁhitā. cf. Rasayogasāgara, intro. pp. 70-1. Bheḍa Saṁhitā is quoted by Tīsaṭa in his Cikitsākalikā, by Jagannatha and in Ṭoḍarānanda. Durgashankar K. Shastri has proposed "about 300. A. D." as the probable date of the Bheḍa Saṁhitā (cf. *Ayurved no Itihas* p. 75). (9) *Aśvini Saṁhitā*. The Harītakīkalpa from this work is edited in two recensions (shorter-27 verses, longer-37 verses) from two MSS in possession of Dr. P. Cordier by Hoernle along with the Bower MS.

p.14.*l*.9—cf. Winternitz, *HIL* III, 547-8; A. B. Keith, *HSL*, 307-8.

p.14.*l*.11—On the date of Suśruta Saṁhitā, see S.N. Dasgupta, *HIP* II, 425 ff., G. N. Mukhopadhyay, *SIH*, I, p. 15, Dr. G. K. Garde, *Vāgbhaṭa*, intro. pp. 9-10, P. C. Ray, *HHC* I, intro. pp. xiv-xxi, Hemaraj Pandit, *Kāśyapa Saṁhitā*, intro.pp. 63-76, Gananath Sen, *PS*, intro. p. 53, Ekendranath Ghosh, IHQ IV-3, pp. 557-9, R. V. Patwardhan, *Suśruta translation*, intro. p. 8, Vaidya Hariprapannaji, *RYS*, intro. pp. 68-70.

p.14.*l*.32—One of the sources of Ḍallana's comm. is Brahmadeva who may perhaps be identified with Śrībrahma, father of Maheśvara—the author of Viśvaprakāśa and Sāhasāṅkacarita. cf. note on *p*. 16.*l*.35. Maheśvara's date is 1111 A. D. So Śrībrahma may be placed about 1080 A. D., cf. Hoernle, JRAS, 1906, p. 699. Another authority quoted by Ḍallaṇa is Bhoja who may well be the famous king of Dhara. cf. Hoernle, ibid. p. 286. For the date and works of Ḍallana cf. Hoernle, ibid., S. N. Dasgupta *HIP* II, p. 434 ff., G. A. Grierson, JRAS 1906, pp. 692-3.

p.14.*l*.33—There is one more commentator, Gayadāsa, who

wrote comms. both on Suśruta and Caraka, viz. Nyāyacandrikā or Pañjikā and Carakacandrikā respectively. Ḍallaṇa in his Nibandhasaṁgraha comm. on Su quotes from Gayadāsa's comm. on the same. Gayadāsa's fragmentary comm. on Su is printed. He belonged to Bengal and adorned the Royal court of Mahīpāla, one of the great Pāla kings. He flourished in the 10th cen. A. D. cf. Hoernle, *Osteology*, intro. p. 16, ZDMG 56, p. 114, JRAS 1906, pp. 293-303; Jolly, ZDMG 1904, pp. 114-16; D. C. Bhattacharya, *New light on Vaidyaka Literature*, IHQ, June 1947, pp. 123-55.

*p.*15.*l.*9—For chemistry in Su see P. C. Ray, *HHC* I, 17-27.

*p.*15.*l.*28—Other editions are :- (1) published by Shrīlayogeshchandra Basak, Calcutta, with Sanskrit comm. by Hārāṇachandra Chakrabarti, Vols. I-IV, 1910-28. (2) Venkateshvar Press, Bombay. (3) Edited Y. T. Acharya, with Ḍallaṇa's comm., Nirṇaya Sagar press, Bombay, 1915, 1931. (4) with Marathi trans. by D.B. Borkar, Poona, 1934. (5) Śārīrasthāna with English trans. by R. V. Patwardhan, Poona.

*p.*16.*l.*10—For the different Nāgārjunas see Winternitz, *HIL*, II, 343-4 n, S. C. Vidyabhushan, *Medieval Indian Logic*, pp. 68-70, S. N. Dasgupta, *HIP* II, 426-7, 436, Gananath Sen, *PS* intro. pp. 11-2, B. N. Seal, *Positive Sciences of Hindus*, p. 62 f., Hemaraj Pandit, *Kāśyapa Saṁ*. intro. pp. 111-2, Vaidya Hariprapannaji, *RYS* intro. p. 70, Hoernle, *Osteology*, pp. 98-102.

*p.*16.*l.*12—On the date of Caraka see A. B. Keith, *HSL*, pp. 506-7, S. Levi IA XXXIII, p. 282, WZKM XI, p.164, S. N. Dasgupta, *HIP* I, pp. 280 ff., Hemaraj Pandit, *Kāśyapa Saṁ*. intro. pp. 83-97, Winternitz *HIL*, III, pp. 611-4, P. C. Ray, *HHC* I, intro. viii-xiv, G. N. Mukhopadhyay *SIH* I, pp. 5-9, Dr. G.K. Garde, *Vāgbhaṭa*, intro. pp. 5-8, R. V. Patvardhan, *Suśruta Saṁhitā*, Śārīrasthāna (Eng. trans.) intro. pp. 4-6, 9, Gananath Sen, *PS*, intro. pp. 6-10, Vaidya Hariprapannaji, *RYS*, intro. pp. 71-84, S. N. Dasgupta, *HIP* II, pp. 395, 431. For the views advocating prebuddhistic date for Caraka, see P. C. Ray, G. N. Sen, G. N. Mukhopadhyay, Hemaraj Pandit, Hariprapannaji, R. V. Patwardhan.

*p.*16.*l.*32—The names of commentaries or their comms. may be enumerated below :— (1) Haricandra, quoted by Maheśvara in Viśvaprakāśa, by Candraṭa, by Hemadri in Āyurvedarasāyana comm. on AHr. A MS (No. 13092, Govt. Ori. MSS. Lib., Madras) containing comm. on 3rd Adhyāya of Sūtrasthāna is preserved. (2) Caraka-

pañjikā by Ācārya Svāmikumāra. A MS of the same is preserved in the Calcutta Sanskrit College library, it breaks off in the 2nd adhyāya of Sūtra. There is also a MS (No. 13091) in the Govt. Ori. MSS. Lib., Madras. (3) Jayanandi (4) Sandhyākara (5) Govardhana (6) Munidāsa (7) Jinadāsa (8) Vakulakara (9) Īśvarasena (10) Īśānadeva (11) Bāspacandra or Bāpyacandra (12) Kṛṣṇavaidya (13) Agniveśa.

*p.*16.*l.*35—Jaijjaṭa or Jaiyyata who is said to have written a comm. on Su, has also commented upon Caraka (edn. Lahore, 1941). He was a disciple of Bāhaṭa (Vāgbhaṭa) according to the several colophons of the printed fragment and has quoted many earlier commentators. His date is 875-900 A. D. cf. D. C. Bhattacharya, *New Light on Vaidyaka Literature*, IHQ, June 1947. Gayadāsa is another commentator of Caraka. See note to *p.* 14. *l.* 33. Svāmikumāra wrote a comm. called Carakapañjikā. He was a buddhist and refers to Haricandra—an old commentator of Caraka. Haricandra also called Hariścandra or Bhaṭṭārahariścandra wrote a comm. called Carakanyāsa. A MS containing comm. on the first three adhyāyas of Sūtra, is at the G. O. M. Library, Madras. Pandit Mastaram Shastri of Ravalpindi has partly published it. Haricandra flourished in the 6th cen. A. D. According to Y. T. Acharya (Caraka Saṁ. intro. N. S. press, Bombay, 1940) he flourished in the 5th cen. Bāṇabhaṭṭa in his Harṣacarita (1.17) and Jejjaṭa in his comm. have referred to Haricandra. He was the court-physician of king Sāhasāṅka. Maheśvara, the author of Viśvaprakāśa (1111 A. D.), himself proud of his knowledge of Vaidyaka, was born of a family of physicians claiming descent from Haricandra. Haricandra also wrote a revised version of Khāraṇāda Saṁhitā and also composed a medical Saṁhitā of his own. cf. D. C. Bhattacharya, IHQ, June 1947; *Kalpadrukośa*, intro. p. xxviii.

*p.*17.*l.*2—On Dṛḍhabala and composition of the Caraka Saṁhitā see Hoernle, *Osteology*, p. 11, *The Composition of Caraka Saṁhitā and the Literary Methods of the Ancient Medical Writers*, JRAS 1908, pp. 997-1028, *The Composition of Caraka Saṁhitā in the Light of the Bower MS*, JRAS 1909, pp. 857-93, H. Luders, *Festgabe Garbe*, p. 154, S. N. Dasgupta, *HIP* II, pp. 428-31, Vaidya Hariprapannaji, *RYS*, intro. p. 70.

*p.*17.*l.*4—For the style of Caraka Saṁhitā cf. Yogeshwar Pande (Allahabad University), *A critical study of the prose of the Caraka Saṁhitā*, Summaries of papers, p. 167, 16th session of AIOC,

Lucknow, October 1951.

p.17.*l*.13—The number of adhyāyas in each sthāna is as follows :- Sūtra. 30, Nidāna 8, Vimāna 8, Śārīra 8, Indriya 12, Cikitsā 30, Kalpa 12, Siddhi 12 = 120.

p.17.*l*.22—Bheḍa Saṁhitā is edited by Sir Asutosh Mukerjee, Calcutta,1921 (Calcutta University). " Some light has been thrown by the discoveries of manuscripts in Eastern Turkestan on the Bheḍa Saṁhitā (cf. H. Lüders, Festgabe Garbe, pp. 148 ff.). A paper manuscript with a fragment of the text, which can be assigned to the ninth century A. D. suggests strongly that the text published from a single Telugu manuscript presents a version of the Saṁhitā which has suffered alteration, a chapter on Raktapitta in the Nidānasthāna having been replaced by one on Kāsa " (Keith, HSL, Preface xxiii).

p.17.*l*.24—For reference to Agniveśatantra in later authors cf. S.N. Dasgupta, *HIP* II,428-31, Hemaraj Pandit, *KS*, intro. p.111.

p.18.*l*.15—For §§ 10 & 15 cf. Weber, *HIL*, 265-7, Winternitz, *HIL* III, 541-4, Keith, *HSL*, 505-15.

p.18.*l*.29—For the contemporaneity of Ātreya and Jīvaka see Rockhills, *Life of Buddha*, p. 65.

p.18 *note* 8—An edition of Caraka Saṁhitā in six volumes has been published in 1949 by Shree Gulabkunverba Āyurvedic Society, Jamnagar. It contains Gujarati, Hindi and English translations and in the last volume also a number of useful indices and pictures of animals, birds and plants. It has also an extensive introduction reviewing the entire Ayurvedic literature.

p.20.*l*.1—Besides the medical glossaries, references to medical plants, diseases etc. may be copiously found in general Sanskrit glossaries. e.g. Amarakośa with Kṣīrasvāmin's comm. (see the edition published by the Poona Oriental Book Agency, intro. by Dr. Har Dutt Sharma). Kṣīrasvāmin in his comm. refers to the following medical authorities :- Suśruta-Sauśrutāḥ, Vaidyāḥ (chiefly Caraka), Dhanvantarinighaṇṭu, Bāhaṭa or Vāghbhaṭa, Candra, Indu, Candranandana, Dhātuvidaḥ, Nimi, Haramekhala.

p.20.*l*.3—The main points in Zachariae's work may be noted down here :- The most important of the medico-botanical glossaries are found gathered together in Burnell's Catalogue of Tanjore MSS, pp. 70 ff., and the Catalogue of India Office Library by Eggeling, p. 973 ff. Some of these may be recorded here :— (1) *Dhanvantarinighaṇṭu* is older than Amarakośa as informed by Kṣīrasvāmin in his

comm. It has 9 chapters. (2) A medico-botanical glossary is attributed to *Śāśvata* (the author of Anekārthasamuccaya or a different one ?). It is called Sarasvatīnighaṇṭuva and was published in Colombo in 1885 (and 1884 ?). cf. Transaction of the Philological Society, London 1875-76, pp. 78 ff.; Litteraturblatt für ori. Phil. II, 31. Śāśvata, the author of Anekārthasamuccaya is older than Amara. (3) *Nighaṇṭuśeṣa*. A botanical glossary in 396 verses, being a supplement to Abhidhānacintāmaṇi (edited by Bohtlingk). It is in fact a supplement to verses 1131-1201 (Vanaspatikāya) i. e. to the chapter to which Hemacandra has not written any *śeṣa*. The small work is divided into 6 kāṇḍas of unequal extent which, according to the serial order, treat with vṛkṣa, gulma, latā, tṛṇa and dhānya. Accidentally the chapter on varieties of lotus (III, 323-331), as well as the entire dhānyakāṇḍa coincide with the corresponding sections of Abhidhānacintāmaṇi (1160 ff., 1168 ff.). The chapter on precious stones about which Bühler speaks (of course on the authority of an oral communication with Dr. Bhau Daji) is not found in the present edition. This edition (Abhidhānasaṁgraha II, No. 9) shows a big gap at the beginning of the first kāṇḍa and a few smaller gaps in the other kāṇḍas. An old MS of this work is recorded by Peterson, 5th Report, p. 23. It is a palm leaf MS written 15 years after the death of Hemacandra. It would not be difficult to prepare an edition of this work, more correct and complete than the Bombay edition, with the help of this MS. There does not appear any comm. on Nighaṇṭuśeṣa. (4) Abhidhānaratnamālā (Ṣaḍrasanighaṇṭu) by an unknown author. This is cited by Mallinātha (cf. Aufrecht, Preface to *Halāyudha*, VII, Eggeling, Catal. p. 977 a). (5) *Madanavinoda* by Madanapāla (Ind. Stu. XIV, 399). (6) The homonymic Śivakośa of Śivadatta with the comm. of Śivaprakāśa. It is written in 1677 A. D. In addition there are the following works :- (1) *Soḍhalanighaṇṭu* by Soḍhala, a Gurjar Brahman. (2) *Kaiyyadevanighaṇṭu* or *Pathyāpathyavibodha* by Kaiyyadeva, son of Sāraṅga, grand son of Padmanābha (edited by Surendramohan, Meherchand Lachchmandas, Lahore, 1928, pt. 1). (3) *Paryāyaratnamālā* or *Ratnamālā* by Mādhavakara, author of Rugviniścaya. It is a collection of nearly 200 verses. (4) *Paryāyamuktāvali* by an unknown author. (5) *Bhāvaprakāśakosa* (6) *Bhāvaprakāśanighaṇṭu* (7) *Aṣṭāṅganighaṇṭu* (8) *Aṣṭāṅgahṛdayanighaṇṭu* (9) *Vāgbhaṭakosa* (10) *Vāgbhaṭanighaṇṭu* (11) *Vaidyakanighaṇṭu* (12) *Śākanighaṇṭu* by Sitarama Shastri.

p.20. § 11—Soḍhala also wrote *Guṇasaṁgraha*. *Nalapākadarpaṇa* published in Chowkhamba Sanskrit Series, Banaras. *Nighaṇṭuśeṣa* by Hemacandra (1092-1173 A. D.) edited by K. P. Parab and others, Bombay, 1889. *Dravyāvalinighaṇṭu* by Mahendrabhogika, age of MS Saṁvat 1572. Bhāvamisra's *Harītakyādinighaṇṭu* is printed at Venkatesvar Press, Bombay.

p.20. § 12—For beginnings of animal medicine in India cf. R. Fick, *Social Organisation in North-west India in Buddha's time*, pp. 166 ff., Rhys Davids, *Buddhist India*, p. 266, Ratilal Mehta, *Prebuddhist India*, pp. 310-11, Bombay, 1939, D. R. Bhandarkar, *Asoka*, pp. 297 ff. 2nd edn., A. D. Pusalkar, *Bhāsa—a study*, pp. 410 ff., Winternitz, *HIL* III, 532-3, G. N. Mukhopadhyay, *HIM* II, 356-9, 400 ff., Jolly, *Kauṭilya's Arthaśāstra*, *Śukranītisāra* 4.7. The following works besides those recorded in this section may be mentioned :- Śālihotronnaya, Tanjore Catal. of MSS, lvii, *Aśvapraśaṁsā*, GOML, Madras, No. 13317, *Mātaṅgalīlā* by Nīlakaṇṭhācārya, (with comm., Trivandrum Sanskrit series), *Aśvalakṣaṇaśāstra* with Telugu meaning, GOML, Madras, No. 13318. See also MSS No. 1321-3. The Agnipurāṇa devotes 6 chapters to the veterinary science (see chapters 279-302). For the date of Agnipurāṇa, see Dr. P. V. Kane, *Hist. Dharm.* I, p. 172, Dr. R. C. Hazra, *Purāṇic Records on Hindu Rites and Customs*, pp. 134-40, Dacca, 1940. Garuḍapurāṇa contains references to the veterinary science which are based on the Asvacikitsā of Nakula, ibid.

p.20.*l*.28—*Pathyāpathyanighaṇṭu* is also called *Dravyaguṇaśataśloki* or simply *Śataśloki*. Other editions of the work are :- (1) with Hindi trans. by Krishnalal, Bombay, 1894 (2) with Hindi trans. by Śaligram Vaidya, Bombay, 1897. Kṛṣṇadatta (1700 A. D.) has written a comm. called Dravyadīpikā or Dīpikā on this work. He was the son of Śivadatta who wrote Śivakośa. Śivadatta's father was Caturbhuja. See note to *p*. 2.*l*.33.

p.20.*l*.29—*Pathyāpathyaviniścaya* printed with Hindi trans.

p.20.*l*.30—*Bhojanakutūhala* was composed by Raghunātha, a protege of queen Dipabai, wife of Ekoji Bhonsale of Tanjore. The author was a Maharashtra Brahman and composed the work before 1700 A. D. He wrote some more Sanskrit and Marathi works. cf. P. K. Gode, ABORI, XXII, pt. 3-4, 1942, pp. 254-63, JBU, X, pt.2, pp. 132-40; PO VIII, pt.1-2, pp. 1-8. *Kṣemakutūhala* was composed by Kṣemarāja or Kṣemaśarman in 1548 A. D. Published by Y. T.

Acharya, Bombay. The author also composed Cikitsāsārasaṁgraha. Another work on cooking is *sūpaśāstra*—a Sanskrit work consisting of 45 verses with kannada commentary. cf. Shrimati Shantadevi Malwad, *Sūpaśāstra—an ancient work on the science and art of cooking*, Summaries of papers, p. 261, 16th session of AIOC, Lucknow, October 1951.

p.21.*l*.25—see note to *p*. 20. § 12.

p.21.*l*.26—For the literature on Vṛkṣāyurveda see G. P. Majumdar, *Upavanavinoda, Vanaspati*, Calcutta; Ratilal Mehta, *Prebuddhist India*, pp. 188 ff., Śukranītisāra, 4.4.44-59, Agnipurāṇa 281, Bṛhatsaṁhitā, 54, Kauṭilīya Arthaśāstra, 24.

p.22.*l*.15—For the details of the medical MSS found in Eastern and Southern Turkestan, see Hoernle : *An Ancient Medical Manuscript from Eastern Turkestan*, R. G. Bhandarkar Commemoration Volume, pp. 415 ff.; H. Lüders, *Festgabe Garbe*, pp. 148 ff. " Another manuscript written on leather, from South Turkestan or Northern India, dating probably from the end of the second century A. D., say a hundred years before the manuscript of the *Kalpanāmaṇḍitikā* and fifty years after the manuscript of Aśvaghosa's plays, is of interest, as it preserves a tradition of a doctrine of eight or ten *rasas* as opposed to the six which Caraka and Suśruta recognize and which are generally accepted in Indian Medicine. It is possible that we here have a trace of an older medical system, which was ultimately superseded by the system of Ātreya on which the work of Caraka is based " (Keith, HSL, Preface xxiii).

Prof. Johannes Nobel has very recently published a study in German language (*Ein alter medizinischer Sanskrit-text und seine Deutung*, Supplement to JAOS, No. 11, July-September 1951, pp. 1-35) of the 16th chapter called "Vyādhipraśamana" of Suvarṇaprabhāsasūtra–a Sanskrit work belonging to the Mahāyāna Buddhism. The chapter is obviously a medical tract dating as back as 300 A. D., i. e. earlier than the Bower MS. The entire sūtra has been translated into the Tibetan language. There are also two Chinese translations : one is by Dharmakṣema who flourished in Central India and went to China in 414 A. D. where he stayed until 433 A. D.; it was translated between 414 and 421; the other is by I-tsing—the famous pilgrim who travelled in India and died in 713 A. D. The medical tract is a very small chapter consisting only of 13 verses, some of which

are badly preserved. The Tibetan trans. substantially helps in restoring their text. Looking to the brevity of the chapter, I-tsing added 24 verses of his own, making a total of 37 verses, and also wrote some portion in prose. The work, even though a small one, is very important for the study of the origins of the Āyurvedic science, because in certain essential points such as the meaning of the term *dhātu* it deviates substantially from the teachings of Caraka and Suśruta. The Tibetan trans. has endeavoured, as is always the case, to interprete the text faithfully, while the Chinese translations have tried to reconcile the Buddhistic Medicine with the contemporary Indian Medicine, ignoring the philological precision.

p.22.*l*.32—A Devanāgarī edition of the Bower MS is published by Kaviraj Balvant Singh Mohan, *Āyurvedīya Nāvanītakam*, published by Meharchand Lachchmandas, Lahore, 1925. On the Bower MS cf. A. B. Keith, *HSL*, pp. 509-10; Winternitz, *HIL* III, 544-5; Chemistry in Bower MS is brought out by P. C. Ray, *HHC* I, 28-9.

p.23.*l*.5—For Medicine in Vimuttimagga, reference may be made to Prof. Nagai's article in the journal of the Pāli Text Society, 1917-9, pp. 69-80. cf. also Dr. P. V. Bapat, *Unidentified Sources of Vimuttimagga*, ABORI, XII, 207-11.

p.23.*l*.11—For Yuan Chwang on Indian Medicine cf. T. Watters, *Yuan Chwang*, I, 174.

p.23 § 14—Medicine in Buddhist text is discussed by Radhakumud Mukerjee, JUPHS XV, pt. 1, pp. 30 ff. See also Ratilal Mehta, ibid. pp. 307-11, R. Fick, ibid. pp. 234-7, Rhys Davids, ibid. p.98. *Mahāvyutpattikośa*–an extensive Buddhistic Sanskrit kośa deals, among other things, with names of organs of body, animals, plants, diseases etc. edited by J. P. Minayeff, St. Petersburg, 1887. cf. Winternitz, *HIL* III, 415.

p.25.*l*.5—For medicine and alchemy in Kauṭilya's Arthaśāstra see Jolly, *Festschrift Windisch*, pp. 103 ff., R. K. Mukerjee, ibid., pp. 29-30, A. D. Pusalkar, ibid. p. 409, G. N. Sen, *PS*, intro. p. 3, G. N. Mukhopadhyay, *HIM* II, pp.362-6.

p.25.*l*.10—Over a dozen medical works are mentioned in the Brahmavaivartapurāṇa. "Nothing is known of these texts and it is difficult to say if they actually existed." cf. Dasgupta *HIP* II, 432-3; G. N. Sen, *PS*, intro. pp. 14-5. See note to *p*.21.*l*.25. cf. Dr. D.V.S.

Reddy, *Medical lore in Samskrit Dramas*, PO IX, pt. 1-2, pp. 27-33. Medicine in Mahābhārata is brought out by C. V. Vaidya, *Mahābhāratācā Upasaṁhār* (Marathi), pp. 422-3. See also Rāmāyana 2.10.30, 66. 14. Medicine as depicted in Pāṇini's Grammar is discussed by R. K. Mukerjee, ibid.

p.25.*l*.22—Tibetan anatomical system of. E. H. C. Walsh, JRAS, 1910, pp. 336-40; JRAS 1911, pp. 208; J. F. Fleet, JRAS 1911, pp. 208-9.

p.26.*l*.12—cf. Mahārāshtrīya Jñānakosh (Marathi) V, 382.

p.26.*l*.17—For Medicine in ancient Arabia cf. Mahārāshtrīya Jñānakosh (Marathi) V, 254-83, 382; P. C. Ray, *HHC* I, intro. lxxvii-lxxix; Winternitz, *HIL* III, p. 554; Macdonell, *HSL*, 426-7; Dr. G. K. Garde, *Vāgbhaṭa*, intro. p. 33. For Medicine in ancient Persia cf. ERE VI, *Diseases and Medicine* (Persia). For the Medicine in ancient Iran see J. J. Modi, ABI, V, 101-3.

p.27.*l*.6—see also Sachau, *Alberuni's India*, pp. 30 ff.

p.27.*l*.7—For Greek Medicine cf. ERE, *Health and Gods of Healing* (Greek) VI, 541; Hemaraj Pandit *KS*, intro. pp. 161-6, 172-94; A. F. R. Hoernle, *Osteology*, intro. p. 4; Keith, *HSL*, 513-5;Jolly ERE VI, *Diseases and Medicine* (Hindu); Weber, *HIL*, p.269; Winternitz, *HIL* III, p. 554; Macdonell, *HSL*, p. 426; Dr. Garde ibid.; P. C. Ray, ibid. p. xxi; G. N. Banerji, *Hellenism in ancient India*, pp. 230 ff.

p.28.*l*.17—For the reason leading to the decline of surgery in ancient India, see Keith, ibid. p. 408; B.N. Seal, *Positive Sciences of the ancient Hindus*; R. V. Patvardhan, Suśruta Śārīra, trans.,intro. p. 9; G. N. Sen, *PS*; Bhagavat Sinhjee, pp. 185 ff; Hariprapannaji, *RYS* intro. p. 15.

p.28.§ 17—Works of some authors deserve special mention :— *Hindu Medicine* by Dr. H. R. Zimmer, John Hopkins Press, Baltimore, 1948. The book is divided into two chapters : (i) Medical tradition and the Hindu Physician (ii) The Human body : Its forces and resources. *La Doctrine Classique de la Médecine Indienne : Ses origines et ses paralleles Grecs* (The Classical Doctrine of Indian Medicine : Its origins and Greek Parallels) by Dr. Jean Filliozat, pp. 230, Paris, 1949. It makes a critical and historical survey of the Indian Medical science with special reference to Vedic and Greek Medicine, as will be seen from the titles of its chapters given below :- (i) The classical

Indian medicine : The Āyurveda (ii) Pre-Aryan and Indo-Iranian medical data (iii) Material from the Vedic Saṁhitās on pathology (iv) Material from the Vedic Saṁhitās on Physiology (vi) Veda and Āyurveda (vii) The Ayurvedic theory of wind and the Greek Pneumatism (viii) The Timèe of Plato and the Indian Medicine (ix) Communications between Greece and India before Alexander. *Etude de Démonologie indienne : Le Kumāratantra de Rāvaṇa et les textes paralleles indiens, tibetains, chinois, cambodgien et Arabe* (Study of Indian Demonology : The Kumāratantra of Rāvana and the Indian, Tibetan, Chinese, Cambodian and Arabic parallel texts) by the same author, Paris,1937.The book has the following chapters:-(i) The Kumāratantra and its medical parallels, (ii) Non-medical parallel Sanskrit documents (iii) Divers Indian Documents (iv) Documents foreign to India (v) The character and the divers aspects of the demon Rāvaṇa. Dr.Filliozat has also written *Fragments de textes Koutcheens de médecine et magic*, Paris, 1948; *Nāgārjuna et Agastya, medecins, chimistes et sorciers*, Bruxelles, 1938. Dr. E. Benveniste has written *La doctrine medicale des Indo-Européens*. *Revue de l'Histoire der Religions*, tome cxxx, 1945, pp. 1-12. Important contributions to the study of the different aspects of Indian Medicine have also been made by other French scholars.Sections dealing with Indian medical literature are found in M.Winternitz, *Geschichte der indischen Litteratur* III, Leipzig, 1922,pp. 541-54; A. B. Keith, *History of the Sanskrit Literature*, London,1928, pp. 505-15. The latter has the following chapters :- (i) The development of Indian Medicine (ii) The older Saṁhitās (iii) The medical tracts in the Bower MS (iv) Later medical works (v) Greece and Indian Medicine.

p.32.l.13—cf. Arrian's *Indian History*, Vol. II, chap. 15; Mcrindle, *Invasions of India*, Appendices, pp. 368-9, 1893.

p.32.l.15—The life and work of Jīvaka Komārabhacca is sufficiently discussed by R. K. Mukerjee, ibid. pp. 30-8; see also R. Fick, ibid. p. 96; T. Watters, *Yuan Chwang*, II, p. 151; Oldenberg, *Buddha* (Eng. trans.) pp. 163, 147; Rockhill's *Life of Buddha*, pp. 95-106, 64-5, 93.

p.33.l.30—*Nāḍīparīkṣā* ascribed to Rāvana, edited by Y. T. Acharya, Bombay, 1923. *Nāḍīparīkṣā* by Rāmacandra Somayājin, written in 1349 A. D. *Nāḍīvijñāna* by Kaṇāda, with Sanskrit comm. printed at Venkateshvar press, Bombay.

p.34.*l*. 14—Two different symptoms of pulse exhibiting signs of possession by evil spirits are described by Dr. B. Bhattacharya, *Bhautika Pulse*, Summaries of papers, p. 149, 14th session of AIOC, Darbhanga, October 1948.

p.35.*l*.3—One of the works dealing with omens is *Narapati-jayacaryā* by Narapati of Dhar composed in Saṁvat 1232. Printed with Sanskrit comm. at Venkateshvar press, Bombay.

p.35.*l*.5—One of the works dealing with dreams is *Svapna-cintāmaṇi* by Jagaddeva of Gujarat composed in 1160.

p.35.*l*.29—Car 5.2.6-7 mentions an ariṣṭa by which a man would die after one year. Vaikhānasa Gṛhya sūtra 5.1 refers to ariṣṭas by which the time of a man's death could be known three years before his death.

p.43.*l*.18—For weights and measures in Kauṭilya's Artha-śāstra, see A. D. Pusalkar, *Bhāsa–a study*, p. 449.

p.61.*l*.29—For a recent attempt to attribute the conception of the theory of blood-circulation to Su, see Hariprapannaji, ibid. p.28.

p.62 § 35—For a detailed study of Āyurvedic anatomy see Dr. Dhirendranath Banerjee, *Āyurved Śarira* Vol. 1, Calcutta, Madras, 1951.

p.73. § 39—The author has used the word *Menstrualblut* (menstrual blood) probably to mean *ārtava*. The root-meaning of *ārtava* is "that which is produced during *ṛtu* or menstruation" (*ṛtukālodbhavam ārtavam*) i.e. ovum (cf. *ṛtustu dvādaśarātraḥ*) as well as menstrual blood. So the meaning of the word " menstrual blood " should be understood according to the context.

p.79 § 41—cf. Mrs. Gulabbai L. I. M., *The conception of Embryology in Ancient India*, Summaries of papers, p. 260, 16th session of AIOC, Lucknow, October 1951.

p.101.*l*.5—There is no reference to heating on fire. The sūtra (*musalabudhnena navanītānvaktena...*) states that the mortar-pestle is to be anointed with butter.

p.109.*l*. 27— The author probably explained the word *raktapittopagatam* as " under pressure " meaning thereby blood-pressure.

p.162.*l*.35—According to Su 4.2.33 (Nirnaya Sagar press edn.) the trauma is to be sprinkled with the ghee made of goat's milk (*ājena sarpiṣā*), not with goat's urine (*Ziegenurin*). The

former serves well the purpose of curing the trauma.

p.166.*l*.8—Jolly's text omits, probably due to a printing mistake, a reference to the ten eye-diseases from pitta.

p.168.*l*.9—Bisavartman. Jolly has " Visavartman ", but see Nirnaya Sagar edn. of MN).

p. 180.*l*.23— cf. also Kāmandakīya Nītisāra 7.11.9-29; Śukranīti 1. 326-8.

p.184.*l*.13—*Yogaśataka* is printed at Venkateshvar press, Bombay.

p.184.*l*.24—For the so-called Saṁhitās of Jatūkarṇa and others see note to *p*.13.*l*.21.

Sanskrit Index

General Index

Erratā

Page	*Line*	*Incorrect*	*Correct*
14	20	Razi	Rāzī
14	22	Sanaq	Śānāq
14	24	chalid	chālid
15	23	opthalmology	ophthalmology
26	20	mathra	mānthra
27	1	Razi	Rāzī
34	10	breast	chest
57	25	cohabitation and sleeping by day in a cool place should be avoided.	cohabitation should be avoided. By day one should sleep in a cool place.
122	16	Albuminairhae	Albuminorrhae
129	33	yedza	yedzā
143	21	a kind	a kind of

THE END



Vaidya
Medicine — India
India — Medicine
V